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ABSTRACT

This document is the first volume of a state curriculum guide on vocational agriculture for use in the 9th and 10th grades in Louisiana. Three instructional areas are profiled in this volume: orientation to vocational agriculture, agricultural leadership, and soil science. The three units of the orientation area cover introducing beginning students to the total program in vocational agriculture, introducing students to the advanced program options (designed to prepare for occupational choices), and developing the individual supervised occupational experience program. The four units of the agricultural leadership area cover introduction to Future Farmers of America (FFA), awards and contests, leadership training, and participation in FFA activities. The soil science instructional area contains seven units covering soil formation, soil properties, soil acidity and liming, soil classification and land use evaluation, soil fertility and fertilization, soil water, and soil judging. Each unit contains one to several individual lessons, with student objectives (terminal and specific), suggested teaching materials, special arrangements for the teacher to make, tips on presenting the lesson, content outlines, and suggested student activities. An extensive section of transparency masters and accompanying scripts as well as student materials completes the units. Soil science tests are appended. (KC)

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STATE OF LOUISIANA

DEPARTMENT OF EDUCATION

BULLETIN 1690-I

THE BASIC PROGRAM OF VOCATIONAL AGRICULTURE IN LOUISIANA
AG I and AG II
(9th and 10th grades)

VOLUME I

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
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Spring, 1983

Office of Vocational Education

N. J. Stafford, Jr., Ed.D.
Assistant Superintendent

J. KELLY NIX
STATE SUPERINTENDENT

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FOREWORD

This curriculum guide is a result of extensive work on the part of numerous agricultural educators. The materials included here were developed for the express purpose of aiding secondary vocational agriculture teachers. The hope is that by having practical and usable teaching materials in their hands, teachers will be able to make improvements in their instructional program as well as have increased time available to spend on other phases of the total vocational agriculture program.

I wish to express my personal gratitude and that of the Department of Education to each vocational educator whose efforts and expertise were contributed throughout the development of this curriculum guide. The results of your efforts will significantly benefit vocational agriculture teachers and students in Louisiana.

J. Kelly Nix

J. KELLY NIX
State Superintendent
Department of Education

ACKNOWLEDGEMENTS

This publication represents the cooperative efforts of personnel in the Department of Vocational Agricultural Education, Louisiana State University and the Vocational Agriculture Section in the Office of Vocational Education, Louisiana State Department of Education. Special recognition goes to Dr. Michael F. Burnett who served as project director in the development of the guide. Special commendation goes also to members of the writing team who worked diligently to make this publication a reality.

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Dr. Jimmy S. McCully, Jr., Curriculum Materials Center, Mississippi State University, who provided valuable technical consultation; and

A special acknowledgement to the Curriculum Materials centers at AAVIM (American Association of Vocational Instructional Materials), Texas A&M University, and Oklahoma State University. These centers made numerous contributions to this project by allowing relevant materials already in existence to be freely adapted for use in this curriculum guide.

The following Louisiana Vocational Agriculture Teachers gave freely of their valuable time to serve on the curriculum review panel.

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Jerry Dosher
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Wayne R. Howes

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Lawrence L. Powell
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Lionel Wells

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Assistant Superintendent
VOCATIONAL EDUCATION

TABLE OF CONTENTS
ORIENTATION TO VOCATIONAL AGRICULTURE

UNIT PAGE

I. Orienting Beginning Students to the Total Program of Vocational Agriculture

Lesson 1: The Instructional Program in Vocational Agriculture (Basic, Advanced, and Adult) ---------- 1
Lesson 2: Relationship of FFA to the Total Instructional Program ---------- 8
Lesson 3: Introduction to Production Supervised Occupational Experience Programs (SOEP) ---------- 14
Lesson 4: Farming Types and Agribusiness in Louisiana and the United States ---------- 19
Lesson 5: Record Keeping as Applied to Supervised Occupational Experience Programs ---------- 32

II. Orienting Students to the Advanced Program Options in Vocational Agriculture Designed to Prepare for the Occupational Choices

Lesson 1: Training Options in Agricultural Production, Nonfarm Agricultural Occupations and Pre-professional Training ---------- 50

III. Developing the Individual Supervised Occupational Experience Program for Students in Vocational Agriculture

Lesson 1: Building the Supervised Occupational Experience Program ---------- 56
Lesson 2: Determining Facilities for Obtaining Individual Work Experience ---------- 61
Lesson 3: Technical and Skill Jobs to Perform While Obtaining Work Experience ---------- 67

ORIENTATION TO VOCATIONAL AGRICULTURE
TEACHING SCHEDULE

UNIT	VOCATIONAL AGRICULTURE	
	I and	II
I. Orienting Beginning Students Total Program of Vocational Agriculture Lesson 1: The Instructional Program in Vocational Agriculture (Basic, Advanced and Adult) Lesson 2: Relationship of FFA to the Total Instructional Program Lesson 3: Introduction to Production Supervised Occupational Experience Programs Lesson 4: Farming Types and Agribusiness in Louisiana and the United States Lesson 5: Record Keeping as Applied to Supervised Occupational Experience Programs	13	
II. Orienting Students to the Advanced Program Options in Vocational Agriculture Designed to Prepare for the Occupational Choices Lesson 1: Training Options in Agricultural Production, Nonfarm Agricultural Occupations and Pre-professional Training		3
III. Developing the Individual Supervised Occupational Experience Program for Students in Vocational Agriculture Lesson 1: Building the Supervised Occupational Experience Program Lesson 2: Determining Facilities for Obtaining Individual Work Experience Lesson 3: Technical and Skill Jobs to Perform While Obtaining Work Experience		7
TOTAL	13 hours	10 hours

TABLE OF CONTENTS
AGRICULTURAL LEADERSHIP

UNIT PAGE

I. Introduction to FFA

Lesson 1: Introduction to History, Aims and Purposes, and Significance to the FFA ------------------------------ 1
Lesson 2: Becoming Familiar with the FFA Creed, Motto, Official Dress, FFA Colors and Degree Advancement -------------------------------------- 8
Lesson 3: Responsibilities and Duties of FFA Officers ---------------------------- 17

II. Awards and Contest

Lesson 1: Introduction to Local, State, and National Awards and Contests and Activities ---------------------- 26

III. Leadership Training

Lesson 1: Public Speaking ----------------------------- 42
Lesson 2: Parliamentary Law --------------------------- 63

IV. Participation in FFA Activities

Lesson 1: Contests, Awards and Activities -- 72
Lesson 2: Fairs, Shows and Sales -- 123

AGRICULTURAL LEADERSHIP
TEACHING SCHEDULE

UNIT		VOCATIONAL AGRICULTURE I	and II
I.	Introduction to FFA Lesson 1: Introduction to History, Aims and Purposes, and Significance to the FFA Lesson 2: Becoming Familiar with the FFA Creed, Motto, Official Dress, FFA Colors and Degree Advancement Lesson 3: Responsibilities and Duties of FFA Officers	4	
II.	Awards and Contest Lesson 1: Introduction to Local, State, and National Awards, Contests, and Activities	2	4
III.	Leadership Training Lesson 1: Public Speaking Lesson 2: Parliamentary Law	16	5
IV.	Participation in FFA Activities Lesson 1: Contests, Awards, and Activities Lesson 2: Fairs, Shows, and Sales	6	6
	TOTAL	28 hours	15 hours

TABLE OF CONTENTS
SOIL SCIENCE

UNIT PAGE

I. Soil Formation
Lesson 1: Definition of Soil ---------- 1
Lesson 2: Composition of Soil -- Sources and Content ---------- 7
Lesson 3: Factors Affecting Soil Formation ---------- 12

II. Soil Properties
Lesson 1: Physical Properties of the Soil ---------- 22
Lesson 2: Chemical and Biological Properties of the Soil ---------- 31

III. Soil Acidity and Liming
Lesson 1: Soil Acidity and Alkalinity ---------- 40
Lesson 2: Liming to Correct Soil Acidity ---------- 48

IV. Soil Classification and Land Use Evaluation
Lesson: Soil Classification and Land Use/Evaluation ---------- 63

V. Soil Fertility and Fertilization
Lesson 1: Nutrient Requirements of Plants ---------- 83
Lesson 2: Organic and Inorganic Fertilizers ---------- 94
Lesson 3: Application of Fertilizers ---------- 104

VI. Soil Water
Lesson: Classification -- Gravitational, Capillary, Hygroscopic and Water-holding Capacity of Soil ---------- 113

VII. Soil Judging
Lesson: Conducting Soil Judging Contest ---------- 121

Soil Science Tests ---------- 128

SOIL SCIENCE
TEACHING SCHEDULE

UNIT	VOCATIONAL AGRICULTURE	
	I and	II
I. Soil Formation Lesson 1: Definition of Soil Lesson 2: Composition of Soil Lesson 3: Factors Affecting Soil Formation	5	
II. Soil Properties Lesson 1: Physical Properties of the Soil Lesson 2: Chemical and Biological Properties of the Soil	6	
III. Soil Acidity and Liming Lesson 1: Soil Acidity and pH Lesson 2: Liming to Correct Soil Acidity	5	
IV. Soil Classification and Land Use Evaluation Lesson: Soil Classification and Land Use/Evaluation		4
V. Soil Fertility and Fertilization Lesson 1: Nutrient Requirement of Plants Lesson 2: Organic and Inorganic Fertilizer Lesson 3: Application of Fertilizers		7
VI. Soil Water Lesson: Classification -- Gravitational, Capillary, Hygroscopic and Waterholding Capacity of Soil		4
VII. Soil Judging Lesson: Conducting Soil Judging Contest	2	2
TOTAL	16 hours	15 hours

INSTRUCTIONAL AREA: Orientation to Vocational Agriculture

INSTRUCTIONAL UNIT I: Orientation of Beginning Students to the Total Program in Vocational Agriculture

LESSON 1: The Instructional Program in Vocational Agriculture (Basic, Advanced, and Adult)

I. Preparation for Instruction

A. Student Objectives

1. Terminal: To outline the format of the entire vocational Agriculture/Agribusiness/ FFA Programs in Louisiana and explain the purposes.

2. Specific:

a. Outline the Basic Agricultural Program for grades 9 and 10.
b. Describe the major emphases of the four segments of the Vo Ag Ed program.
c. Outline the three training options at the advanced level of Vo Ag Ed for specialized training.
d. Define what groups should be served by youth and adult education programs.
e. List the main objectives of the youth and adult education programs.
f. Explain the types of instruction received in the basic, specialized, and adult education programs in agriculture.
h.

i.

j.

B. Review of Teaching Materials

1. Handbook for Teachers of Vocational Agriculture in Louisiana. Baton Rouge:

Louisiana State Department of Education, Bulletin 1237, 1981.

2. Vocational Agriculture/Agribusiness Program Planning. Baton Rouge: Louisiana State Department of Education, Bulletin 1570, 1981.

C. Special Arrangements

1. Materials

Handout: Outlining the program and all opportunities in Vo Ag Ed (9-12 grades and adult education).

2. A-V Equipment

Overhead -- Vo Ag Ed Schematic

II. Presentation of Lesson

A. Motivation

1. Take an oral in-class survey:

   a. What students live on farms, rural nonfarm, suburbs, or city?

   b. Who has raised an animal?

   c. Who has raised some plants (decorative, grain, vegetables)?

   d. Who likes to spend time in the woodlands?

   e. Who likes to work at beautifying the environment?

   f. Who likes to work with tools?

2. Discuss the results of the survey and why there is a need for a variety of instruction in Vo Ag Ed.

B. Content Outline

1. Vocational Agricultural Education Program

a. Involves:

1) Ninth and tenth grade students,

2) Eleventh and twelfth grade specializing students, and

3) Adults and out-of-school youth.

b. Emphasizes:

1) A foundation in agricultural sciences and leadership with exploratory work in farming and agricultural occupations. This should occur in the ninth and tenth grades.

2) Specialized training in farming, agribusiness or pre-college preparation in the eleventh and twelfth grades.

3) An increase in knowledge, understanding, and skills in practical agricultural applications for any out-of-school youth or adults.

c. Main objectives of Vocational Agriculture Youth programs:

1) Develop career skills and objectives in agriculture.

2) Promote creative activities of students.

3) Provide balance and meaning in the total educational program of the new school and of individuals.

4) Provide opportunity to participate in community leadership activities.

5) Give meaning and practical applications of the content of other subject matter areas.

6) Develop understanding of the contributions and relationships of agriculture to society.

7) Develop positive attitudes and ability to work with others.

8) Promote environmental quality.

9) Develop management skills.

d. Main objectives of Vocational Agriculture adult programs:

1) Upgrade present skills and educational level.

2) Develop new skills.

3) Keep abreast of rapid technological changes.

4) Develop the ability to be economically efficient.

5) Create interest in areas other than vocational interests.

6) Gain knowledge and understanding of safety precautions.

7) Develop consciousness of adults regarding their civic responsibility in the state and nation.

2. The Basic Vocational Agricultural Program (Ninth and Tenth grades) Transparency I-1-A

I. Basic Instructional Program for Youth at the Ninth and Tenth Grade Levels:

INSTRUCTIONAL AREA	HOURS VOCATIONAL AGRICULTURE	
	I	II
Soil Science	16	15
Plant Science	20	17
Animal Science	24	15
Agricultural Mechanics	29	28
Orientation to Vocational Agriculture	13	10
Career Information	6	8
Agricultural Leadership	28	15
Environmental Protection	-	6
Energy Conservation	-	4
Local Option*	34	52
TOTAL	170	170

*In addition to the instructional areas specified in Vocational Agriculture I and II, additional hours are allocated to be used as a local option to better meet student and/or community needs.

NOTE: An acceptable program in vocational agriculture/agribusiness shall include supervised occupational experience provided in a work setting approved by the school in which relevant agricultural experience can be obtained by the student.

Areas of instruction should prepare students for further vocational instruction at the eleventh and twelfth grade levels.

3. The Specialized Vocational Agriculture Program (Eleventh and Twelfth)

   a. Areas of Specialization

      1) Production Agriculture

         a) Students should choose a type of farming such as cotton, broilers, soybeans, swine, and sugarcane.

b) Specialized classroom work will be supplemented with supervised work in farming on the home farm, school farm, or other acceptable farm.

2) Off-Farm Agriculture

a) Students may elect a particular occupational title in one of the following eight occupational areas.

(1) Farm Service,
(2) Farm Machinery Sales and Service,
(3) Agricultural Service,
(4) Crops, Forestry, and Soil Conservation,
(5) Livestock and Poultry,
(6) Ornamental Hortriculture,
(7) Wildlife and Recreation, and
(8) Farm Supplies and Equipment.

b) Students receive specialized classroom instruction and work experience related directly to their occupational choice.

3) Pre-College Agriculture

a) The instruction program takes into account the needs of students who are college bound in preparation for professional careers in agriculture.

b) Classroom work is supplemented with work experience in the chosen profession (i.e. Veterinarian's Assistant).

4. Out-of-School Youth and Adult Education Programs in Agriculture

a. The program includes short and intensive courses of systematic group instruction in practical agricultural problems.

b. The program serves young and older farmers and also non-farm agricultural adults with a sincere interest in agriculture.

C. Suggested Student Activities

1. Interview a third or fourth year student about his experiences.

   Report his/her findings to the class.

2. Each student will contact a person in an agricultural occupation and find out the basic requirements of the job.

D. Study Questions

1. In what instructional area is the most class time spent in Vo-Ag I and II?

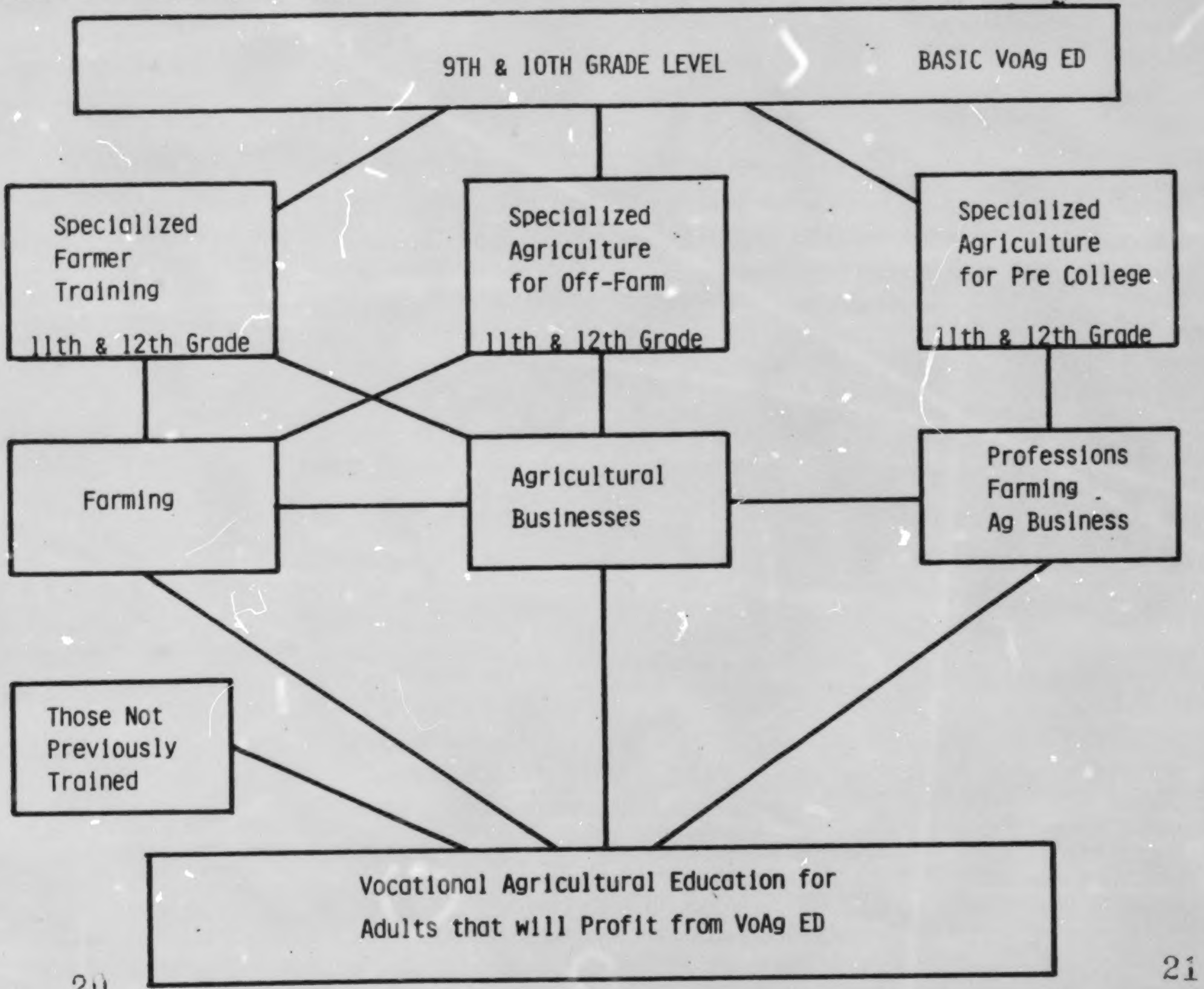
2. What are the three training options at the eleventh and twelfth grades?

3. Who is eligible for the adult education program?

4. What should the student be ready to do at the completion of Vo-Ag II?

5. What are some topics of instruction in the Adult Education program?

6. Why do the ninth and tenth graders study such a variety of topics?



9TH & 10TH GRADE LEVEL

BASIC VoAg ED

Specialized
Farmer
Training
11th & 12th Grade

Specialized
Agriculture
for Off-Farm
11th & 12th Grade

Specialized
Agriculture
for Pre College
11th & 12th Grade

Farming

Agricultural
Businesses

Professions
Farming
Ag Business

Those Not
Previously
Trained

Vocational Agricultural Education for
Adults that will Profit from VoAg ED

TRANSPARENCY I-I-A

INSTRUCTIONAL AREA: Orientation to Vocational Agriculture

INSTRUCTIONAL UNIT I: Orientation of Beginning Students to the Total Program in Vocational Agriculture

LESSON 2: Relationship of FFA to the Total Instructional Program

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Explain how the FFA is related to the Vocational Agricultural Education Program as a total instructional unit.

2. Specific:

a. Define the FFA (Future Farmers of America).
b. Discuss how the FFA is organized.
c. Name three primary elements of the Vocational Agriculture/Agribusiness program.
d. Diagram the relationship of the three program elements using circles and words.
e. Explain the 12 aims and purposes of the FFA as they relate to Vocational Agriculture Education.
f. Explain how the FFA motto reflects the spirit of Vo Ag Ed.
g.
h.
i.

B. Review of Teaching Materials

1. FFA Advisors Handbook. National FFA Center. Alexandria, Va. 1975.

2. Phipps, Lloyd J. Handbook on Agricultural Education in Public Schools. Danville, Ill.: The Interstate Printers and Publishers, 1980.

C. Special Arrangements

1. Materials

FFA Student Handbook and/or Manual (latest issue)

2. A-V Equipment

Overhead (Transparencies)

II. Presentation of Lesson

A. Motivation

Discuss ways in which students would prefer learning. Classroom lecture, field trips, hands-on with the real thing, movies, etc. Where would they learn and remember the most?

B. Content Outline

1. Terms:
    a. FFA -- Future Farmer's of America -- the national organization of, by, and for students of Vocational Agriculture/ Agribusiness.

    b. Organized Instruction -- classroom component, with practical application in the school or extended classroom (field trips).

    c. Supervised Occupational Experience (SOEP) -- students' use of knowledge and skills outside the classroom under teacher supervision.

    d. Organization of FFA -- The FFA is a national organization with membership from students enrolled in vocational agriculture/agribusiness in 50 states and Puerto Rico. Each state has its own FFA Association made up of local FFA chapters; however, all are a part of the National FFA Organization. The FFA is an integral part of the curriculum of vocational agriculture. (Transparency I-2-A)

2. The Vocational Agricultural/Agribusiness Program
    a. Consists of three principal elements:
        1) Organized instruction,
        2) Supervised Occupational Experience, and
        3) FFA -- Activities.
    b. Public Law 740:
        1) Makes FFA an integral part of the Vocational Agriculture instructional program.
        2) Example: FFA Beef Proficiency award program.

(a) learn advanced methods of beef cattle production in the classroom,

(b) raise and train beef cattle for show and sale, judge at general livestock contest, and

(c) apply for the award to be recognized for past accomplishments.

c. Relationship of organized instruction, FFA activities, and SOEP.

1) Organized instruction provides two basic, in-class types of curriculum students receive as part of the formal instruction. This instruction is applicable in both FFA activities, such as judging contests, and in the SOEP of each student.

2) FFA activities provide opportunities for students to apply classroom instruction in a practical and meaningful way. In addition, activities are promoted that are not taught as part of the organized curriculum such as leadership and community relation activities.

3) SOEP also makes instruction in agriculture practical and meaningful. It may overlap with the FFA activities since the two may be combined if a student uses a SOEP for awards and contests in the FFA.

4) In Transparency I-2-B, the relationship of these three elements is illustrated with the rise of overlapping circles. This shows that all three overlap each other in their activities, yet maintain an influence and integrity of their own. This necessitates the existence of all three as separate yet integral parts of the total vocational agriculture/agribusiness program.

3. The FFA motto reflects the spirit of Vocational Education (Transparency I-2-C)

"Learning to Do,
Doing to Learn,
Earning to Live,
Living to Serve."

Learning skills by hands-on experience produces a citizen that is more capable of earning a living which allows him or her spare time to serve the community in which he/she lives.

4. The FFA was formed for 12 specific purposes. The primary aim of the Future Farmers of America is the development of agricultural leadership, cooperation, and citizenship. The specific purposes for which this organization was formed are as follows:

   a. To develop competent and aggressive agricultural leadership.

   b. To create and nurture a love of agricultural life.

   c. To strengthen the confidence of students of vocational agriculture in themselves and their work.

   d. To create more interest in the intelligent choice of agricultural occupations.

   e. To encourage members in the development of individual occupational experience programs in agriculture and establishment in agricultural careers.

   f. To encourage members to improve the home and its surroundings.

   g. To participate in worthy undertakings for the improvement of the industry of agriculture.

   h. To develop character, train for useful citizenship, and foster patriotism.

   i. To participate in cooperative effort.

   j. To encourage and practice thrift.

   k. To encourage improvement in scholarship.

1. To provide and encourage the development of organized recreational activities.

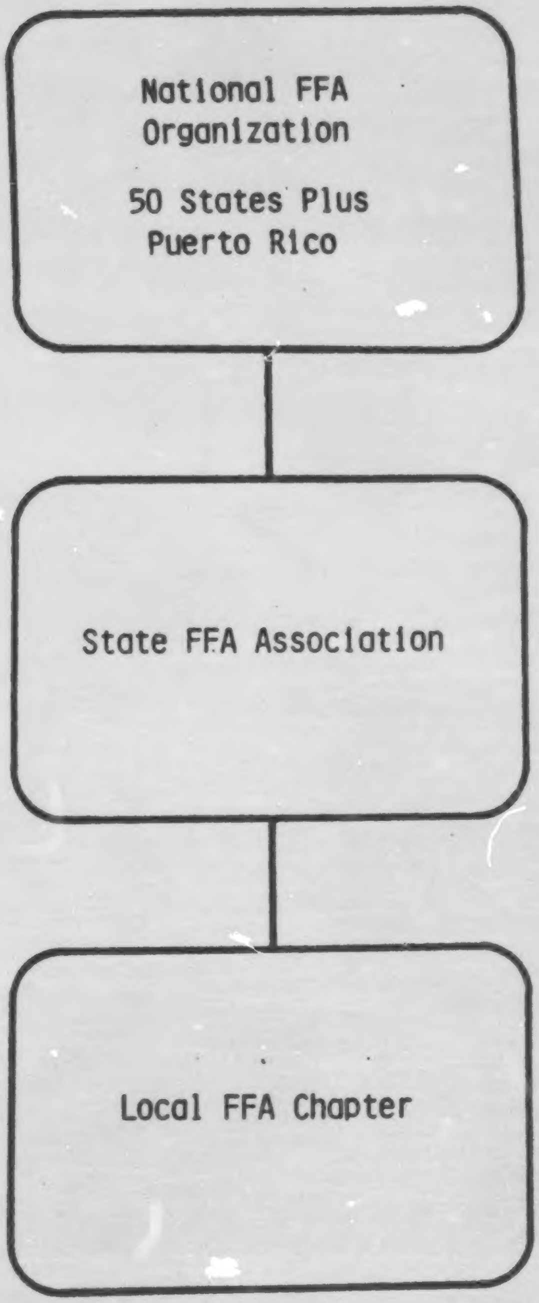
C. Suggested Student Activities

1. Prepare a bulletin board that illustrates the relationship of the three elements of Vo Ag Ed.
2. Have each student write a description of a typical day in a Vo Ag student's life that involves all three elements.

D. Study Questions

1. List the four actions that are described in the FFA motto.
2. What are the three elements of Vocational Agriculture Education? Draw them and their relationship using three circles.
3. Why was the FFA organized?
4. What is an SOEP? Give two examples.
5. Give an example for each of the 12 purposes of the FFA.

FFA ORGANIZATION PLAN



National FFA Organization

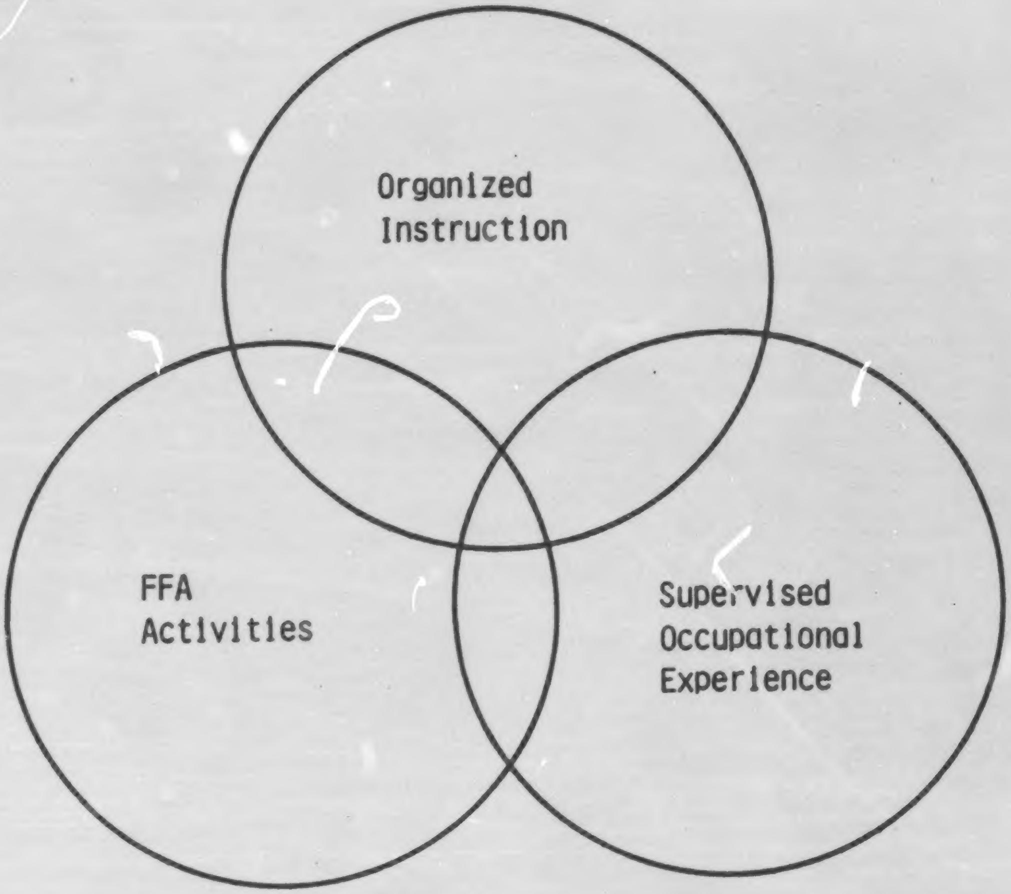
50 States Plus Puerto Rico

State FFA Association

Local FFA Chapter

TRANSPARENCY I-2-A

RELATIONSHIP OF FFA TO AGRICULTURE/AGRIBUSINESS EDUCATION


Organized
Instruction
FFA
Activities
Supervised
Occupational
Experience

TRANSPARENCY I-2-B

Learning to do

Doing to learn

Earning to live

Living to serve

TRANSPARENCY I-2-C

INSTRUCTIONAL AREA: Orientation to Vocational Agriculture

INSTRUCTIONAL UNIT I: Orienting Beginning Students to the Total Program of Vocational Agriculture

LESSON 3: Introduction to Supervised Occupational Experience Programs (SOEP)

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Explain the SOEP as it relates to the student in Vocational Agricultural Education

2. Specific

a. Define SOEP.
b. Give reasons for conducting an SOEP.
c. Describe the various activities that may possibly be included in as SOEP.
d. List the contents of an SOEP plan.
e.

f.

g.

B. Review of Teaching Material

Phipps, Lloyd J. Handbook of Agricultural Education in Public Schools. 4th Edition. Danville, Ill.: Interstate Printers and Publishers, Inc., 1980.

C. Special Arrangements

1. Materials -- Set of Record Books
Proficiency Award forms
State Degree forms

2. A-V

a. Slide project with slide set showing SOEP's previous students.

b. Films -- "Stars Over America"

3. Travel -- Tour the best SOEP of the previous year.

II. Presentation of Lesson

A. Motivation

1. Use slides of outstanding students' programs.
2. Visit outstanding SOEP of former students.
3. Review outstanding record books.
4. Discuss the budgeting and money-making capabilities of SOEP.
5. Film -- "Stars Over America"

B. Content Outline

1. Terms:

   a. SOEP, Supervised Occupational Experience Program -- consists of all the practical agricultural activities of educational value conducted by students and supervised by the teacher with help from other individuals (parents, employers, etc.), and makes classroom instruction meaningful.

   b. Occupational Objective -- the student's choice of jobs when formal education is complete.

   c. Budget -- estimate of receipts and expenses for an enterprise or program.

2. Activities which may be included in an SOEP:

   a. Placement -- Agribusiness/off-farm
      Production/farm

   b. Student Owned or Partially Owned Enterprises -- conducted at home or on school or public land

      - crops
      - livestock
      - mechanics

   c. Improvement Projects

      - farm
      - home
      - community

   d. Self-Employed -- services offered to community

      - animal care
      - yard maintenance and landscape
      - mechanical care and maintenance

3. Reasons for conducting SOEP:

   a. Relate class work to the real world

   b. Gain valuable experience in the desired occupational area

   c. Develop originality and pride in ownership

   d. Gain experiences in record keeping and budgeting

   e. Become established in business or farming

4. Considerations when developing and planning an SOEP:

   a. Occupational objective

   b. Financial situation

   c. Land available with easy access

   d. Animal or shop facilities available

   e. FFA degrees sought

5. Things to be included in an SOEP plan:

   a. Type of activity or enterprise

   b. Size or scope

   c. Objectives for each activity or enterprise

   d. Goals

   e. Budget

   f. Ways of financing

   g. Agreement among all parties concerned

   h. Calendar of events

   i. Facilities and equipment needed

   j. Records to be kept and how they will be used

   k. Plan for the use of money earned

   l. Plan for the future of the activity of enterprise

   m. Detailed list of skills to be accomplished

6. Examples of SOEP activities

    a. Home improvement -- repairing window screens and porches, constructing walks, painting the house or installing a septic tank.

    b. Swine breeding -- begin with one gilt, keeping the two growthiest gilts from each litter and selling all others as feeder pigs.

    c. Lawn and yard care service -- student makes services available at fixed rates.

        - trimming shrubs, pruning trees, weeding and cultivating beds, planting and maintaining ornamentals, and cutting grass.

C. Suggested Student Activities

1. Make a listing of several possible SOEP's that would support the student's occupational objective.

2. Interview a senior student to discover what his SOEP contains.

D. Study Questions

1. How does an SOEP relate to classroom instruction?

2. What are four reasons for conducting an SOEP?

3. List four different occupational objectives.

4. Why should a plan be developed before undertaking an SOEP?

5. What does a budget contain?

6. Must you own 100 percent of an enterprise? Explain.

INSTRUCTIONAL AREA: Orientation to Vocational Agriculture

INSTRUCTIONAL UNIT I: Orienting Beginning Students to the Total Program of Vocational Agriculture

LESSON 4: Farming Types and Agribusiness in Louisiana and the United States

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Describe the different types of farming and agribusiness in Louisiana and the United States.

2. Specific:

a. List the farming types found in Louisiana and the United States.
b. State the approximate acreage used for producing each of these farm types.
c. List the top five farming types that have the highest cash receipts in Louisiana.
d. Describe the importance of forestry to Louisiana agriculture.
e. Name the types of agriculture in Louisiana.
f. Identify the geographic areas in Louisiana and the United States where the various farming types are dominant.
g. Explain the importance of agribusiness to agriculture.
h. List the 15 types of agribusiness.
i.

j.

k.

B. Review Teaching Material

1. Krebs, Alfred. Agriculture in Our Lives. Danville, Ill.: The Interstate Publishers, 1978.
2. Donahue, Roy L., James E. Christiansen, and Everett F. Evans. Exploring Agriculture. Englewood Cliffs, N. J.: Prentice Hall, 1979.
3. Stone, Archie A. Careers in Agribusiness and Industry. Danville, Ill.: The Interstate Publishers, 1970.
4. Agriculture Statistics and Prices for Louisiana 1976-1979, Lonnie Felder and Bergen Nelson, DAE Research Report No. 571, Dept. of Agriculture Economics and Agribusiness, LSU.
5. Louisiana Agriculture - Economic Trends and Current Status 1940-1977, Stephen D. Reiling and Fred Weigman, Bulletin No. 718, Agriculture Experimental Station, LSU.
6. Louisiana Summary -- Agriculture and Natural Resources 1981, Cooperative Extension Service.

C. Special Arrangements

1. Prepare maps of Louisiana and the United States from transparency master. Have copies of maps for each student as a class assignment.
2. Invite the county agricultural agent and/or a farmer to give an introductory lecture on the importance of agriculture in Louisiana. He can show a film if a pertinent one is available.

II. Presentation of Lesson

A. Motivation

1. Local farmer and/or county agricultural agent will discuss the impact of agriculture in the local community and how the various agricultural enterprises (farming and agribusiness) influence the local and state economy.

2. Ask students to discuss how many different farming types and agribusinesses they know.

3. Allow the class to guess how many acres, cash receipts, etc. are associated within the farming types prior to the teaching portion of the lesson plan.

B. Content Outline

Introduction -- Agriculture is an important and dynamic business to everyone. We depend on agriculture for food, clothing, and shelter. Agriculture once included strictly farming and ranching. However, agriculture has become so diversified, it has come to mean all activities which involve the production, processing, distribution, and marketing of farm products. To introduce the subject of agriculture, a discussion of farming types and other endeavors relating to and supporting production areas (agribusinesses) will be covered.

1. Farming Types in Louisiana (The following figures are based on 1981 statistics):
    a. Field Crops
        1) Cotton
            a) Estimated yield -- 511 pounds/acre
            b) Cash Receipts -- average $232,128,371.00
            c) Acreage -- 465,000 acres harvested
        2) Rice
            a) Estimated yield -- 4,010 lbs/acre
            b) Cash receipts average -- $272,708,275.00
            c) Acreage -- 667,000 acres
        3) Sugarcane
            a) Acreage -- 253,000 acres
            b) Estimated yield -- 54,000 lbs/acre
            c) Cash Receipts -- $150,269,563.00
        4) Soybeans
            a) Acreage -- 3,128,571 acres
            b) Estimated yield -- 21 bushels/acre
            c) Cash Receipts -- $423,801,157.00

5) Corn

   a) Acreage -- 32,877 acres
   b) Estimated yield -- 73 bushels/acre
   c) Cash Receipts -- $1,674,000.00

6) All Hay

   a) Acreage -- 370,000 acres
   b) Estimated yield -- 2.01 tons/acre
   c) Cash Receipts -- $15,600,000.00
   d) Used on farm where grown -- 728,000 tons

7) Wheat

   a) Acreage -- 302,849 acres harvested
   b) Estimated yield -- 42 bushels/acre
   c) Cash Receipts -- $60,545,571.00

8) Grain Sorghum

   a) Acreage -- 27,000 harvested
   b) Estimated yield -- 3500 lbs/acre
   c) Cash Receipts -- $964,000.00

9) Sweetpotatoes

   a) Acreage -- 27,000 harvested
   b) Estimated yield -- 9500 lbs/acre
   c) Cash Receipts -- $25,646,561.00

10) Irish Potatoes

   a) Acreage -- 2,100 acres
   b) Estimated yield -- 7000 lbs.
   c) Cash Receipts -- $897,000.00

11) Strawberries

   a) Acreage -- 750 acres
   b) Estimated yield -- 6500 lbs/acre
   c) Cash Receipts -- $2,029,800.00

12) Tobacco

   a) Acreage -- 80 acres
   b) Estimated yield -- 500 lbs/acre
   c) Cash Value -- $68,000.00

13) Vegetables for Processing

   a) Acreage -- 210 acres
   b) Cash Value -- $21,277,990.00

b. Fruit and Tree Nuts

1) Pecans

   a) Total Production -- 2,300,000 lbs.
   b) Cash Value -- $9,344,900.00

2) Peaches

   a) Total Production -- 7,008,000 lbs.
   b) Cash Value -- $3,932,172.00

c. Livestock

1) Cattle and Calves

   a) Total Head: Cattle -- 1,350,000 head
      Calves -- 620,000 head
   b) Total Sold: Cattle -- 281,000 head
      Calves -- 317,000 head
   c) Total Production -- 335,620,000 lbs.
   d) Price per cwt: Cattle -- $59.90/cwt
   e) Cash Receipts -- $246,325,000.00

2) Hogs

   a) Total Production -- 54,914,894 lbs.
   b) Total Sold -- 46,808,511 lbs.
   c) Cash Receipts -- $22,000,000.00 (feeder pigs and market hogs)

3) Sheep and Lambs 25

   a) Total Productions -- 431,000 lbs.
   b) Total Sold -- 266,000 lbs.
   c) Cash Receipts -- $1,024,185.00

4) Chickens

   a) Total Production -- 14,775,000 lbs.
   b) Total Sold -- 15,000,000 lbs.
   c) Cash Receipts -- $2,070,000.00
   d) Total Commercial Broilers -- 356,113,000 lbs.
   e) Total Chickens and Commercial Broilers -- 371,113,000 lbs.
   f) Cash Receipts -- $96,440,000.00

5) Eggs

   a) Total Production -- 601,000,000
   b) Total Sold -- 592,000,000
   c) Cash Receipts -- $34,632,000.00

6) Milk and Milk Cows

   a) Total Production -- 1,082,000,000 lbs.
   b) Cash Receipts -- $155,500,000.00

d. Forests

1) Forestry is very important to the Louisiana economy.

2) This type of farming is similar to other types except for the time span between planting and harvesting. About 12 years are required between planting and harvesting pulpwood, while a minimum of 40 years is required for sawtimber.

3) Approximately 50 percent of the state's area is forested. This accounts for about 15 million acres of which 14 million are classified as commercial forest.

4) Softwood accounts for about 54 percent of the growing timber stock

of which hardwood forests constitute the other 46 percent.

5) About 2/3 of Louisiana's commercial forests are found in Farming Areas 1, 2, 3, and 7. (Transparency I-4-A)

e. Aquacultural

1) Louisiana is the leading state in the nation in acres devoted to production of aquatic food animals.

2) About 50,000 acres are devoted to crawfish farming.

3) Double-cropping rice and crawfish is a major trend under way in Louisiana.

4) Catfish farming is second to crawfish in the amount of acres used (6,500 acres).

5) The culture of pet turtles, minnows, crickets, and worms for fish bait comprises a large portion of aquaculture in Louisiana.

6) Alligator farming is on the increase.

7) Oyster culture consumes about 80,000 acres of public water bottoms.

f. Farming Areas in Louisiana (Transparency I-4-A)

1) Western Dairy, Poultry, Livestock, and Pine Area: Timber, milk, broilers, sheep and lambs, cattle and calves.

2) Red River Cotton, Cattle, and Soybean Area: Cotton, soybeans, cattle and calves, corn, hogs, and pigs, pecans, wheat, sorghum, hay, and horses.

3) North Central Dairy, Poultry, and Pine Area: Timber, peaches, eggs, broilers, hogs and pigs, Irish

potatoes, cattle and calves, Irish and sweet potatoes, pecans. 27

4) Mississippi Delta Cotton, Soybean, and Beef Area: Cotton, soybeans, corn, hogs and pigs, wheat, soybeans, cattle and calves, Irish and sweet potatoes, pecans.

5) Southwest Rice, Soybean, Beef, and Dairy Area: Rice, soybeans, cattle and calves, milk, sheep and lambs, horses, corn.

6) Central Mixed Farming Area: Corn, soybeans, cotton, rice, sugarcane, sweet and Irish potatoes, cattle and calves, hogs and pigs, sheep and lambs, horses, sorghum.

7) Southeast Dairy, Poultry, Truck, and Pine Area: Milk, strawberries, cattle and calves, hogs and pigs, Irish potatoes, corn, nursery and greenhouse crops, broilers, and eggs.

8) Sugarcane Area: Sugarcane, corn, soybeans, Irish potatoes, cattle and calves.

9) Truck and Fruit Area: Citrus, vegetables, nursery, and greenhouse products.

g. Farming Areas in the United States (Transparency I-4-B)

1) Humid Subtropical Belt
    Oranges
    Lemons
    Grapefruit
    Pears
    Rice
    Peanuts
    Sugarcane
    Vine Fruits

2) Cotton Belt
    Cotton
    Soybeans
    Rice
    Sugarcane
    Livestock
    Sorghum
    Peanuts
    Tobacco
    Corn

3) Middle Atlantic Truck Crop Belt 28

4) Corn and Winter Wheat Belt
    - Corn
    - Winter Wheat
    - Soybeans
    - Livestock
    - Pastures
    - Tobacco

5) Hard Winter Wheat Belt
    - Wheat
    - Corn
    - Barley
    - Grain Sorghums
    - Sugar Beets
    - Alfalfa
    - Soybeans
    - Livestock

6) Corn Belt
    - Corn
    - Soybeans
    - Oats
    - Barley
    - Clovers
    - Wheat

7) Hay and Dairy Region
    - Hay
    - Pasture Crops
    - Brume Grass
    - Orchard Grass
    - Potatoes
    - Sugar Beets
    - Clovers
    - Oats
    - Barley
    - Rye
    - Beans

8) Spring Wheat Region
    - Soybeans
    - Wheat
    - Oats
    - Barley
    - Rye
    - Flax
    - Clovers
    - Alfalfa

9) Grazing and Irrigated Crop Region
    - Livestock
    - Grains
    - Fruits
    - Vegetables

10) Western Forest and Hay Region
    - Forest Trees
    - Hay Crops
    - Potatoes
    - Sugar Beets

11) Columbia Plateau Wheat Region
    - Wheat -- winter and spring varieties

12) North Pacific Forest, Hay, and Pasture Region
    - Grass and Hay Crops
    - Dairy and Beef Cattle

13) Pacific Subtropical Crop Region
    - Subtropical Fruits
    - Vegetables

2. Agribusiness

a. Production agriculture accounts for only part of the total economic picture associated with agriculture. There are a variety of off-farm marketing, support, and service businesses dealing with agriculture. The farm-supporting firms are usually referred to as the "agribusiness" sector. These firms perform one of the three basic functions:

Provide input or material needed to produce farm products,
Provide specialized services to farmers, and
Are involved with advertising, processing, transporting, storing, packaging, and merchandising farm products.

The agribusiness sector accounts for approximately 20 percent of the total market value of all final goods and services produced in the economy in a given year. This should indicate the size and impact of agribusiness in Louisiana and the United States.

b. Types of Agribusiness

1) Farm Supplies

Building materials
Labor
Farm machinery
Containers
Oil and fuel
Fertilizer
Lime
Insecticides
Herbicides
Small tools

Fencing
Hardware
Repairs
Automobiles
Trucks
Electricity
Tires and batteries
Feed
Seed and plants
Veterinary supplies

2) Services

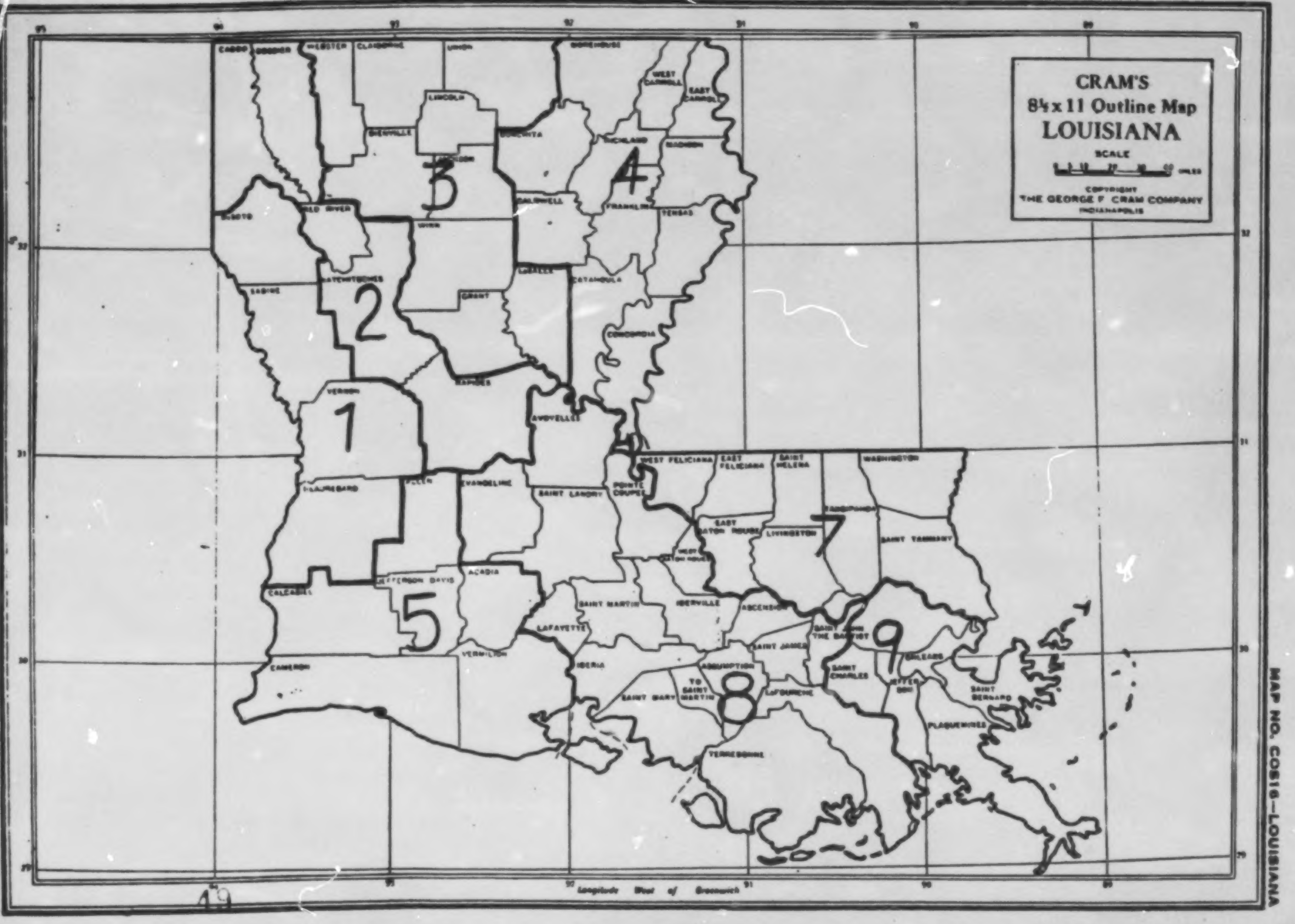
- a) Advertising and promotion
- b) Insurance
- c) Financing
  - Banks
  - Insurance Co.
  - Investment Co.
  - Govt. agencies
  - Private
- d) Grading
- e) Storing
- f) Transportation
  - Airline
  - Train
  - Truck
  - Pipeline
  - Barge
  - Ship
- g) Legal Services
- h) Processing
  - Rice Milk
  - Milk Plants
  - Sugar Milk
  - Cotton Grains
  - Compresses
  - Oil Milk
  - Canning Plants
  - Packing Plants
  - Auctions
  - Hatcheries
  - Lumber Milk
  - Grain Elevators
  - Bakeries
  - Garment Manufacturers
  - Mattress Manufacturers
- i) Wholesaling
- j) Retailing
- k) Research
- l) Public relations
- m) Consumer Information
- n) Education
  - The Farm Press
  - Newspapers
  - Television
  - Radio
- o) Market News
- p) Assembling
- q) Packaging
- r) Risk Bearing
  - Forward Sales
  - Contract Sales
  - Hedging
- s) Management Services

C. Selected Student Activities

1. Each student will be given a map of Louisiana and the United States from the transparency master at the end of the lesson. The students will label and key each map to the various crops grown in each agricultural area in Louisiana and the United States.

2. Each student will list the important farming types in the local school community and give the acreage, yields, and cash receipts for these various types. 31

3. Each student will list and name the agribusinesses in the local community and describe what services are provided by each agribusiness.


CRAM'S
8¼ x 11 Outline Map
LOUISIANA
SCALE
COPYRIGHT
THE GEORGE F. CRAM COMPANY
INDIANAPOLIS
CADDO
BOSSIER
WEBSTER
CLAIBORNE
UNION
MOREHOUSE
WEST CARROLL
EAST CARROLL
LINCOLN
OUACHITA
RICHLAND
MADISON
BIENVILLE
JACKSON
CALDWELL
FRANKLIN
TENSAS
DE SOTO
RED RIVER
WINN
NATCHITOCHES
LA SALLE
CATAHOULA
SABINE
GRANT
CONCORDIA
RAPIDES
VERNON
AVOYELLES
WEST FELICIANA
EAST FELICIANA
SAINT HELENA
WASHINGTON
POINTE COUPEE
BEAUREGARD
ALLEN
EVANGELINE
SAINT LANDRY
EAST BATON ROUGE
LIVINGSTON
TANGIPAHOA
SAINT TAMMANY
WEST BATON ROUGE
JEFFERSON DAVIS
ACADIA
CALCASIEU
SAINT MARTIN
IBERVILLE
ASCENSION
LAFAYETTE
SAINT JOHN THE BAPTIST
SAINT JAMES
ORLEANS
CAMERON
VERMILION
IBERIA
ASSUMPTION
SAINT CHARLES
JEFFERSON
SAINT BERNARD
SAINT MARY
TO SAINT MARTIN
LAFOURCHE
PLAQUEMINES
TERREBONNE
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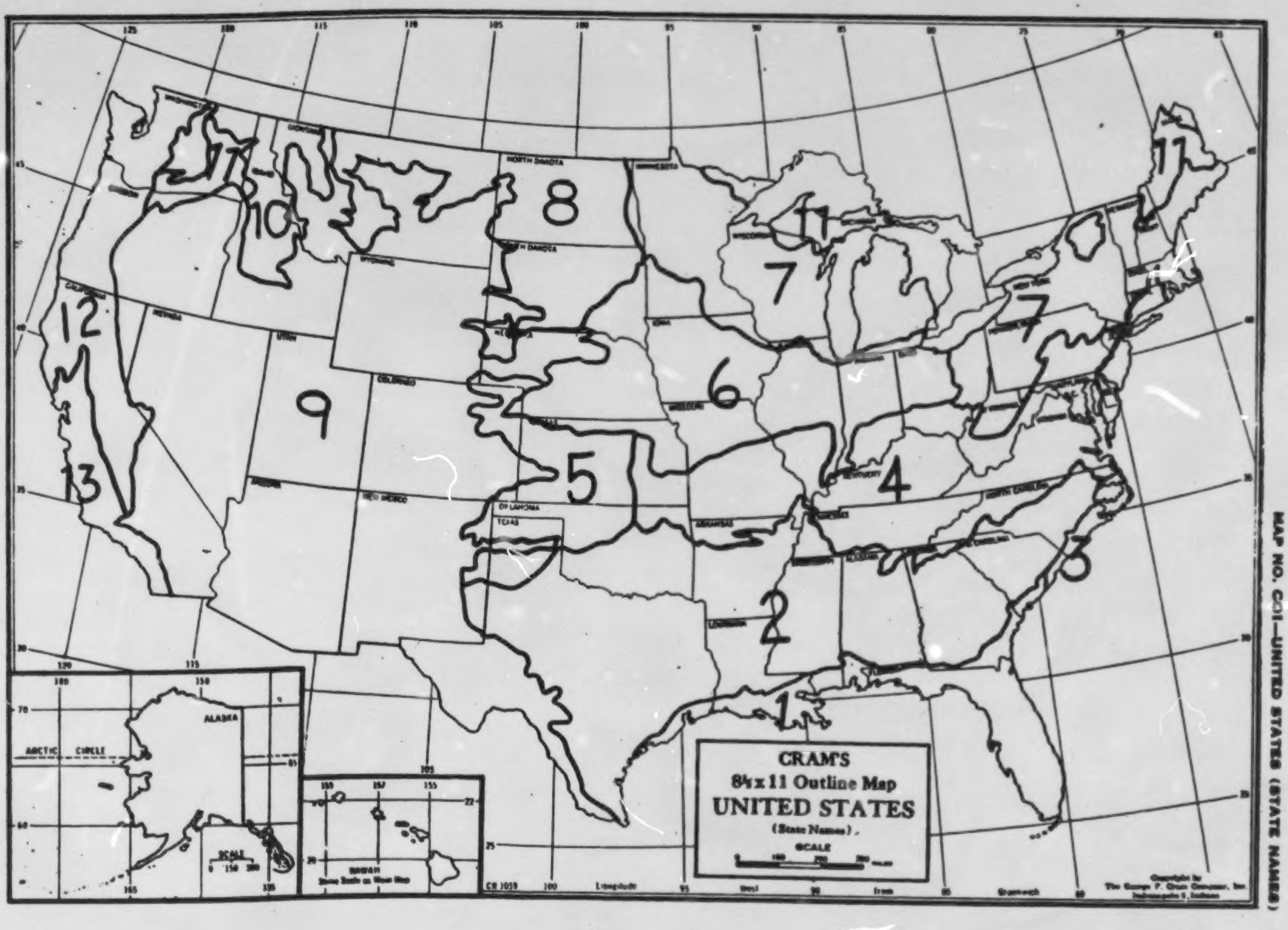
3
4
5
7
8
9
Longitude West of Greenwich
MAP NO. C0516—LOUISIANA

TRANSPARENCY I-4-A


CRAM'S
8¼ x 11 Outline Map
UNITED STATES
(State Names)
SCALE
MAP NO. C01—UNITED STATES (STATE NAMES)
WASHINGTON
OREGON
CALIFORNIA
NEVADA
IDAHO
MONTANA
WYOMING
UTAH
COLORADO
ARIZONA
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MINNESOTA
IOWA
MISSOURI
ARKANSAS
LOUISIANA
WISCONSIN
KENTUCKY
TENNESSEE
MISSISSIPPI
ALABAMA
NORTH CAROLINA
SOUTH CAROLINA
NEW YORK
ALASKA
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HAWAII
Longitude West from Greenwich
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TRANSPARENCY I-4-B

INSTRUCTIONAL AREA: Orientation to Vocational Agriculture

INSTRUCTIONAL UNIT I: Orienting Beginning Students to the Total Program of Vocational Agriculture

LESSON 5: Record Keeping as Applied to Supervised Occupational Experience Programs

I. Preparation for Instruction

A. Objectives

1. Terminal: Identify and complete the SOEP record book that corresponds to the student's particular SOEP.

2. Specific:

a. Define new terms.
b. State three purposes of record keeping.
c. Identify the three types of record books used in the Supervised Occupational Experience Program.
d. List the major components or categories of each of the three types of record books.
e. Calculate the straight-line method of depreciation.
f. Complete a record book exercise for the Basic Experience Program.
g. Complete a record book exercise for the Ownership Experience Program.
h. Complete a record book exercise for the Placement/Directed Laboratory Experience Program.
i.

j.

k.

B. Review of Teaching Materials

1. Record Book for Basic Experience Programs; National FFA Supply Service.

2. Record Book for Ownership Experience Programs; National FFA Supply Service.

3. Record Book for Placement/Directed Laboratory Experience Program; National FFA Supply Service.

4. Teacher's Guide for Record Book in Agriculture/Agribusiness; National FFA Supply Service.

C. Special Arrangements

1. Print copies of record book exercise to pass out to students.

2. Have copies of all three types of record books for students to use in record book exercise.

3. Make arrangements for a successful student who has a good record book to make a brief lecture on how record keeping has helped his/her SOEP.

4. Make transparencies of record book pages as needed for instruction.

D. Materials Required

1. Copies of all three record books.

2. Copies of record book exercises.

II. Presentation of Lesson

A. Motivation

1. Invite a successful student to speak to the class on benefits and need for well-kept record books.

2. Show awards that require that students keep up-to-date and thorough records on their SOEP.

3. The student who best completes the record book exercises will receive 10 extra points

on the grade for this section of instruction.

B. Content Outline

1. Definitions

a. Assets -- Anything that is owned as a receivable which has a positive monetary value.

b. Budget -- An itemized listing of anticipated receipts and expenses on a project to determine the financial success of a given operation or enterprise.

c. Capital -- The accumulation of money, inventory, or credit that can be used to start and operate a business or purchase additional goods or inventory.

d. Cash expense -- The price of all goods and services which are paid for with cash or a check.

e. Cash income -- The receipts for all goods and services which are received in cash or by a check.

f. Depreciation -- The loss of value of a capital asset because of aging. Straight-line depreciation is determined as follows:

$$\text{Depreciation/Years} = \frac{\text{Beginning Value--Salvage Value}}{\text{Years of Life}}$$

Two other popular methods to determine depreciation are the sum of the year's digits and the declining balance method.

g. Inventory -- An itemized list of all of the property and goods owned at any given time. This could include breeding livestock, equipment, machinery, and other materials on hand.

h. Liabilities -- All unpaid bills, mortgages, etc., which apply to the Supervised Occupational Experience Program.

i. Net worth -- Assets minus liabilities.

j. Payables -- Any unpaid bills, mortgages, etc., which apply to the SOEP.

k. Receipts -- Income which has been earned either by working for a salary or from products produced and sold.

l. Receivables -- Income that has been earned either by working for a salary or from products sold but for which no payment has been received.

m. Salvage value -- The estimated value to be received for a depreciable item at the end of its useful life.

n. Supervised Occupational Experience Program -- A part of the school's vocational agriculture/agribusiness program in which students take part in farm, ranch, agribusiness or school laboratory learning experiences to gain knowledge, skill, and on-the-job experience under the direction of the agriculture/agribusiness teacher and an employer on the job.

An integral part of the total vocational agriculture program is the Supervised Occupational Experience Program (SOEP). Coupled with the SOEP is the record keeping responsibilities that must be maintained. In order for the student adequately to understand profit and loss, find ways to decrease expenses, and improve management practices, a properly kept record keeping system is essential.

2. Purposes of Record Keeping

   a. To provide a cumulative and on-going record of a student's SOEP, leadership and personal development, activities, scholarship, FFA achievement, and career goals.

   b. To provide information needed for applying for advanced degrees and awards.

c. To keep a record of accomplishments and progress made toward achieving goals.

d. To aid students in self-evaluation and improvement.

3. Types of Record Books

   a. Record Book for Basic Experience Program

   b. Record Book for Ownership Experience Programs

   c. Record Book for Placement/Directed Laboratory Experience Program

4. Record Book for Basic Experience Program

   a. Calendar of Events -- Space is provided for each student to record those events important to the success of his/her total experience program. Recorded items could be calving dates, while others might be events in which the student would want to participate.

   b. Vocational Agriculture/Agribusiness Program Goals -- Items to be filled in will be course titles, the grade level at which to take certain courses, the semester to schedule courses, and how many credits each course carries.

   c. Goals in FFA Activities -- Degrees, proficiency awards, offices, chairmanships, committees, and contests entered and year to be attained.

   d. Achievement in FFA Activities -- For recognition in the Proficiency Award Program or to earn one or more of the FFA Degrees, a student will need to record actual achievements in the FFA.

   The Areas of Involvement Include:

   1) Offices held and committee responsibilities in the FFA.

   2) Leadership activities sponsored by the FFA. List an activity only once and do not list activities

that have been included in one of the other leadership categories.

3) Cooperative activities sponsored by the FFA. List an activity only once and do not include participation on judging teams, individual exhibition of livestock and crops, or recreational activities.

4) Participation in FFA activities for awards and recognition.

5) Participation in school and community activities other than FFA.

e. Improvement Project -- This is a series of tasks designed to improve or increase the efficiency of the home, agribusiness or farm, or add comfort or convenience of the family. These are in addition to the other parts of the SOEP.

The Areas Included in this Section of the Record Book are:

1) Plans for improvement project
    a) Name
    b) Description -- Note size in either dollar costs, square footage, or length of project in hours, days, or months.
    c) Activities to be performed to complete project.
    d) Estimated labor
    e) Materials and equipment needed
    f) Estimated costs
    g) The agreement -- All parties concerned sign the agreement so all persons know what they are to provide in order that the project may be completed.

        2) Improvement Project Program -- students are to keep records of all activities, costs, and labor on this record sheet.

    f. Resume -- This section of the basic record book is to aid the student in developing a resume that can be used upon graduation. This format presented requests information that is generally a part of all resumes.

    g. Degree Requirements:

        1) Greenhand Degree

        2) Chapter Farmer Degree

        3) State Farmer Degree

5. Record Book for Placement/Directed Laboratory Experience Program. This record book has been designed to be used with the basic record book by students who have SOEP's through means other than ownership.

    a. Occupational Questionnaire

    b. Placement Center:

        1) Type of operation

        2) Size or volume -- Describe overall size of business (dollar volume, people employed)

        3) Livestock equipment and facilities

        4) Type of employee positions

        5) Number of employees

    c. Placement agreement -- This agreement ensures that all people involved understand the requirements of placement. This agreement is to be signed by the student, employer, parent, and teacher.

    d. Record of daily placement activities:

        1) Place of employment

2) Month/year -- The month and year in which work was done. A new record sheet is to be used each month.

3) Date -- The day the work was done.

4) Summary of activities performed -- Describe major daily activities performed.

5) Hours worked per day.

6) Total -- Total monthly hours worked.

e. Expenses for calendar year:

Part I -

Column (1) Date - Day and month

Column (2) Kind of expense item - travel - work, tools - equipment.

Column (3) Paid to - person or company to whom the expenses were paid.

Column (4) Quantity - Total number of items in transaction.

Column (5) Price/Unit

Column (6) Total cash - cash paid on the day of purchase on the day the expense was incurred.

Column (7) Total charge - Amount of money owed to person or company listed in column (3).

Part II

Columns (A)-(D) - Each column represents a separate enterprise. The name of each enterprise involved should be stated in the space provided. All expenses stated in Columns (6) and (7) must be assigned to one of the enterprises identified in Columns (A)-(D).

Paid on Charge -- The amount of money paid on charges listed in Column (7) "total charge." 41

Non-SOEP Expeditures -- Money paid for goods or services not part of SOEP. An example of this type of expenditure is personal automobile expense.

f. Summary of receipts:

1) Source of receipt -- short description of each receipt

2) Date

3) Total hours worked

4) Rate per hour

5) Total wages -- hours worked X rate per hour

6) Non-SOEP income

7) Gifts/Inheritance -- The value of all items given to the student (which will affect the net worth of the student) should be recorded at the time such gifts are received.

8) Gross income -- The total value of each receipt or income before deductions are made.

9)-13) Deductions -- All deductions taken from a student's pay check should be available from the form supplied by the employer. Other deductions would include items such as donations and credit union deductions. Total deductions include total of all deductions.

14) Net income = gross income - total deductions

g. Inventory of receivables and payables

1) Receivables -- total money available including checking account and cash savings on hand.

2) Beginning of year -- total cash receivables at beginning of record year.

3) End of year -- total cash receivables at end of record year.

4) Accounts receivable -- assets the student has control over including money owned by other people.

5) Beginning of the year -- dollar value of all cash receivables at beginning of record year.

6) New accounts -- dollar value of additional cash receivables made in the year.

7) Received on old accounts -- dollar value of deductions made to the cash receivables during the year.

8) End of year -- dollar value of all cash receivables at end of the year.
Column A + Column B - Column C = End of Year

h. Payables:

1) Accounts payable -- total amount owed by the student.

2) Beginning of year -- total money owed at the beginning of record year.

3) New accounts -- dollar value of additions to the various accounts

4) Paid on old accounts -- dollar value of payments

5) End of year -- Column A + Column B - Column C = Amount of money owed by student.

i. Total opening and closing inventory of personal assets -- This is used in determining the student's financial net worth.

1) Item -- written description of the personal asset owned by the student. This is normally a one- or two-word description.

2) Start -- begins at the start of the record-book year. Dollar values are used.

3) End -- dollar of each asset at the end of each record-book year.

j. My Financial Net Worth Statement -- This statement assists the student in observing any financial progress made as a result of the SOEP.

1) Assets:

Column 1 -- Total dollar value at start of first year

Column 2 -- Total dollar value at end of each succeeding year

2) Liabilities -- Total charges gathered during the year

3) Change in Net Worth -- Subtract each column as directed in the record-book.

6. Record Book for Ownership Experience Programs -- This record book has been developed for those students who are involved in Supervised Occupational Experience Programs (SOEP) in which they have ownership.

a. Agriculture/Agribusiness Program Agreement -- This agreement is designed to state, in writing, the exact contribution to be made by each party involved. It should contain the signatures of the parties involved.

b. Expenses for the Calendar Year:

Part I

1) Date -- day and month
2) Kind of expense item -- short, written description
3) Paid to -- person or enterprise to whom the expense was paid.
4) Quantity -- number of units involved
5) Price/unit -- price paid per unit
6) Total cash -- cash paid
7) Total charge -- amount of money owed by the student to the person or enterprise.

Part II

1) Columns (A) through (D) -- Each column represents a separate enterprise. However, the enterprise listed in Column A of this expense page should be the same as the one entered in Column A of receipt page. Expenses in Columns (6) and (7) on pages 3 and 5 must be assigned to one of the enterprises in Columns (A) through (D) or as paid on charge, Capital Expenditures, or Non-SOEP Income.
2) Paid on charge -- money paid on charges in Column (7).
3) Capital Expenditures -- money paid to buy capital item such as a lawn mower, pick-up truck, or greenhouse.
4) Non-SOEP expenses -- money paid for goods or services not a part of the student's SOEP.

NOTE: The total of Column (6) and (7) on pages 3 and 5 must equal the totals of Columns (A) and (B) on pages 4 and 6. All products raised and consumed by another enterprise should be shown as a cash expense to the consuming enterprise and as a cash receipt to the producing enterprise. 45

c. Receipts for Calendar Year:

Part I

Record all receipts on pages 7 and 9, Columns (1) through (8). Columns (A) through (D) are to be used to indicate the amount of money received for goods and services.

1) Date

2) Kind of receipts -- written description

3) Received from -- name of person or enterprise from whom payment was received.

4) Quantity -- number of units

5) Price/unit

6) Total cash -- cash received, value of product transferred from one enterprise to another.

7) Total receivables -- amount of money owed to the student by person in Column (3).

8) Value of products used by family -- items produced as part of SOEP but consumed by family. This will be actual value or price if the item had been sold.

Part II

1) Each column represents a separate enterprise. All income reported in Columns (6), (7), and (8) on pages 7 and 9 must be assigned to one of the enterprises identified in Columns (A) through (D) or as Receivables Received, Capital Receipts, Non-SOEP Income, or Income from Gifts and/or Inheritance on pages 8 and 10.

2) Receivables received -- total amount

3) Capital receipts -- amount of money received from the sale of capital assets.

4) Non-SOEP income -- examples would be allowances and part-time jobs.

5) Gifts and/or inheritance -- dollar value of gifts and/or inheritance at the time they were received.

NOTE: Total of Columns (6), (7), and (8) should equal totals of Columns (A) through (H).

d. Depreciable Assets:

1) Columns (A) - (F) represent separate items of inventory.

2) Description

3) Date acquired -- month and year received.

4) Acquisition cost -- cost of obtaining item

5) Years of life -- estimated number of years of useful value

6) Depreciation method -- cost of ownership must be allocated over total useful life. Method will be straight line, sum of the year's digits, or declining balance.

7) Percent ownership

8) Value my share -- un-depreciated dollar value of each inventory item. Student's share found by multiplying "Depreciable Balance" for any year by "percent ownership."

9) Investment credit claimed -- additional tax deduction the student may take on new machinery.

    10) Twenty percent first year depreciation -- On new machinery, the student may wish to take additional depreciation the first year. This may be no more than 20 percent.

    11) Salvage value -- remaining value of inventory item upon completion of its useful life

    12) Annual depreciation -- annual prorated cost of owning an item

    13) Depreciation claimed in prior years -- total of all depreciation claimed on item since being obtained by the student

    14) Depreciable balance -- the un-depreciated value of each inventory item as of the time it became part of the student's SOEP is obtained by subtracting lines 9, 10, 11, and 13 from line 8.

    15) Year

    16) Depreciation taken

    17) Depreciable balance -- lines 18, 20, 22, 24, and 26

e. Inventory: Beginning inventories are charged as business expense and ending inventories are credited as income.

f. Non-Depreciable Assets

    1) Description -- items owned by the student that are used in SOEP.

    2) Beginning -- day, month, and year

    3) Number -- school quantity of each specific inventory item

    4) Percent ownership -- portion of each inventory item owned by student expressed in percentage

    5) Value student's share -- un-depreciated dollar value of each inventory item owned by the student.

6) Grading -- ending day, month, year 48

g. Inventory of Receivables and Payables:

1) Receivables/assets:

(a) Cash receivables -- total money available including checking accounts and cash savings

(b) Beginning of year -- total cash receivables at beginning of record book year

(c) End of year -- total cash receivables at the end of the record year

(d) Accounts receivable -- assets the student has control over including money owed by other people.

(e) New accounts -- dollar value additions made to cash receivable items in the year.

(f) Received on old accounts -- dollar value of deductions made to the various cash receivable items during the year.

(g) End of year -- dollar value of all cash receivables at the end of the year. Columns (A) + (B) - (C)

2) Payables/liabilities:

(a) Accounts payable -- total amount of money owed by student

(b) Beginning of year -- total money owed at beginning of record year

(c) New accounts -- dollar value of additions made to accounts payable

(d) End of year -- Columns (A) + (B) - (C) 49

h. Total Opening and Closing Inventory of Personal Assets:

1) Item -- one- or two-word description of personal asset owned by student.

2) Start ________, Month ____________, Day _________ -- dollar value of each asset at the beginning of the fiscal year records are kept.

3) End 19 ____, Month ________________, Day _________ -- dollar value of each asset at the end of each fiscal year.

i. My Financial Net Worth Statement:

1) Assets:

(a) Column I -- total dollar value of all items owned at the start of the school year when the student first entered vocational agriculture.

(b) Columns II through VI -- total dollar value at the end of each succeeding year.

2) Liabilities -- total charges accumulated during the year.

3) Change in net worth -- subtract each column as indicated in record book.

C. Student Activities

1. Each student will be given a copy of each record book and a corresponding record book exercise. The students will complete each exercise for the particular record book at the end of that section of instruction in the outline.

2. The students will be given exercises for determining the straight-line method of depreciation.

INSTRUCTIONAL AREA: Orientation to Vocational Agriculture

INSTRUCTIONAL UNIT II: Orienting Students to the Advanced Program Options in Vocational Agriculture Designed to Prepare for the Occupational Choices

LESSON 1: Training Options in Agricultural Production, Nonfarm Agricultural Occupations and Pre-professional Training

I. Preparation for Instruction

A. Student Objectives

1. Terminal: The student will select an occupational option to be pursued in the advanced agriculture option.

2. Specific:

a. Explain the necessity of making occupational selection for Ag. III and Ag. IV.
b. List the three basic types of training options available for students in Ag. III and Ag. IV.
c. State four areas of interest applicable to each training option.
d. Describe the emphasis of each training option.
f. List the curriculum components common to all training options.
g.

h.

i.

B. Review Teaching Material

Vocational Agricultural Program for High School Students in Louisiana. Baton Rouge: Louisiana State Department of Education, 1981.

C. Special Arrangements

1. Invite advanced students in each training option to make a presentation to the class regarding their particular occupational area.
2. Invite individuals from the community who are involved in the three training options to be discussed in class.

II. Presentation of Lesson

A. Motivation

1. Survey class as to their various occupational interests.
2. Advanced students will discuss the various training options they selected.
3. Individuals from farming, agribusiness, and professional areas will present information to class about their respective occupations.

B. Content Outline

All students in vocational agriculture must develop occupational objectives based on their interests and occupational outlook. In preparation for this choice, the student should have participated in the two-year basic program prior to entering the advanced or specialized training at the 11th and 12th grade levels. The major emphasis in this basic program has been placed on agricultural sciences, leadership, and exploratory work in farming and agricultural occupations.

When entering the advanced or specialized training offered at the 11th grade (Agriculture III) and the 12th grade (Agriculture IV) level, the students are required to have an occupational objective which qualifies them for entry into one of the three training options:

1. Farming
2. Off-farm agricultural occupations
3. Pre-college preparation for professional careers in agriculture

1. Farmer Training

   a. This is a major objective of vocational agriculture.

   b. Students choose a farming type found in Louisiana in which they are interested.

   c. Students will follow a course of study prepared by a local teacher regarding the type chosen by the student.

   d. Classroom instruction is supplemented by supervised work of the farming type relevant to the type being studied.

   e. Students involved in this program may have interests in bees, broilers, cotton, corn, fruits, dairy, soybeans, sweet potatoes, sugarcane, swine, horses, catfish, crawfish, hay, or forage crops.

2. Off-farm agriculture

   a. Students desiring to enter occupations related to agriculture who are not desiring to enter on-farm occupations should consider this option.

b. There are eight occupational areas. Students may select a particular occupational title as their objective for instructional purposes.

c. The eight occupational areas are:

   1) Farm Service

   2) Farm Machinery Sales and Service

   3) Agricultural Service

   4) Crops, Forestry, and Soil Conservation

   5) Livestock and Poultry

   6) Ornamental Horticulture

   7) Wildlife and Recreation

   8) Farm Supplies and Equipment

3. Pre-College Preparation

a. This option is designed to fill the needs of youth who are college-bound in preparation for professional careers in agriculture.

b. They may select one or more farming types or specialized training in one of the non-farm employment areas. For example, a student interested in becoming a veterinarian should focus on animal science.

c. Students who select this option may be interested in:

   1) Research

   2) Education

   3) Industry

   4) Communication

5) Conservation

6) Business

4. Occupational Experience -- Cooperative Agricultural Education (CAE)

   a. Designed for juniors and seniors

   b. Students may work on a farm or in an off-farm agricultural farm for one unit of credit.

   c. Students may also enter a cooperative training program provided by the school and a business capable of providing actual experiences related to the occupational training desired.

   d. Students in cooperative programs must spend 15 hours per week at work under school supervision over a nine month period. Junior and senior students may gain realistic work experiences in selected agriculturally oriented businesses and firms. The students will participate according to an individualized training plan developed by the teacher and a representative of the firm. Students in cooperative programs must spend 15 hours per week at work under regular supervision of the teacher-coordinator. The students may earn 3 units of credit for each year.

   e. Schools wishing to participate should request approval from the Vocational Agriculture Division of the State Department of Education.

5. Agricultural Laboratory Classes

   a. The purposes of the Agriculture Laboratory Units are to provide individualized instruction for advanced training or to provide training for disadvantaged students who are juniors and seniors.

   b. The student may take one unit each in Agriculture Laboratory III and IV.

C. Suggested Student Activities

1. Make poster mural illustrating the training option in which the student is interested.

2. The student will make a presentation to the class with regard to the training option he has selected. The student will tell why he selected this option and give factual information about the occupational area.

INSTRUCTIONAL AREA: Orientation to Vocational Agriculture

INSTRUCTIONAL UNIT III: Developing and Improving the Individual Supervised Occupational Experience Program for Students in Vocational Agriculture

LESSON 1: Building the Supervised Occupational Experience Program

I. Preparation for Instruction

   A. Student Objectives

      1. Terminal: Improve the four year plan for a SOEP.

      2. Specific:

         a. Define SOEP.
         b. Give examples of all four types of SOEP's.
         c. List the characteristics of a good SOEP.
         d. Identify procedures needed to build a SOEP.
         e. Distinguish between sound and unsound SOEP plans.
         f.

         g.

         h.

   B. Review of Teaching Materials

      1. Amberson, Max L. and B. Harold Anderson. Learning Through Experience in Agricultural Industry. New York: McGraw-Hill Book Co., 1978.

      2. Phipps, Lloyd J. Handbook of Agricultural Education in Public Schools. 4th Edition, Danville, Ill.: The Interstate Printers and Publishers, Inc., 1980.

C. Special Arrangements

1. Materials -- SOEP Planning Worksheets (3 pages)

2. A - V Equipment -- Slide projector (slide show of former students in SOEP)

3. Travel -- visit the best SOEP's of senior students

II. Presentation of Lesson

A. Motivation -- Show a variety of SOEP slides. Discuss interests of students and opportunities available in the various areas.

B. Content Outline

1. Terms

   a. Enterprise -- a species of livestock, a crop, a mechanic project of agricultural service; unit of organization (i.e. fencing service)

   b. Placement SOEP -- any job where general agricultural experience can be obtained after or before school

   c. Ownership SOEP -- to own and manage an enterprise

   d. Cooperative SOEP -- during school time, on-the-job training in the student's chosen occupation

   e. School laboratory SOEP -- either ownership or placement experience in school lab or on school land

2. Steps in Developing a Sound SOEP

   a. Instruction in relationship of SOEP to Vo-Ag and FFA

   b. Instruction in four types of SOEPs:

      1) Ownership

      2) Placement

      3) Cooperative

      4) School Laboratory

   c. Identify student's agricultural interests.

   d. Identify resources available to student.

   e. Identify student's abilities.

   f. Identify student's career objectives.

   g. Choose major enterprises that will lead to accomplishing the student's objectives.

h. Choose supplemental practices that will add to the program and meet needs not met by the major enterprises.

i. Select improvement projects that will improve the home or farm, increase its real estate value, and contribute to family living.

j. Determine goals for each enterprise and project. Record these in record book.

k. Establish plans of action for reaching goals. (Keep enterprise separate.)

l. Use approved record book to follow project's progress.

m. Evaluate outcomes and apply for awards.

3. Characteristics of a Quality SOEP

   a. Challenges to the student.

   b. Provides for a long number of needed abilities.

   c. Is large enough to make a satisfactory profit.

   d. Contains at least one major enterprise along with improvement projects and supplementary practice.

   e. Will result in the adoption of approved practices by the student.

   f. Will lead toward establishment in the chosen occupations.

   g. Provides opportunities for expansion in the future.

   h. Balance between plant, animal, and mechanical enterprises.

   i. Provides for cooperation between student and parents or community members.

C. Suggested Student Activities

1. Complete worksheets (1-3) in class.

2. Make a list of skills to be learned for each different enterprise, project, or placement experience.

D. Study Questions

1. List four characteristics of a good SOEP.

2. Give an example of each of the four types of SOEP.

3. Define SOEP.

4. Name four places where SOEP's can be carried on.

5. List four items that will influence the choice of your SOEP projects.

INSTRUCTIONAL AREA: Orientation to Vocational Agriculture

INSTRUCTIONAL UNIT III: Developing and Improving the Individual Supervised Occupational Experience Program for Students in Vocational Agriculture

LESSON 2: Determining Facilities for Obtaining Individual Work Experience

I. Preparation for Instruction

A. Student Objectives

1. Terminal: To identify and develop a plan to secure proper facilities needed for the individual student's SOEP.

2. Specific:

a. Determine equipment and facility needs for each enterprise or project in the SOEP plan.
b. Distinguish between adequate and inadequate facilities.
c. Prepare a financial plan for obtaining facilities.
d. Identify procedures for financing ownership programs.
e. Identify transportation means for travel to placement site or other sites of SOEP's.
f.

g.

h.

B. Review of Teaching Materials

1. Amberson, Max L. and B. Harold Anderson. Learning through Experience in Agricultural Industry. New York: McGraw-Hill Book Co., 1978.

2. Phipps, Lloyd J. Handbook of Agricultural Education in Public Schools. 4th Edition, Danville, Ill.: The Interstate Printers and Publishers, Inc., 1980.

C. Special Arrangements

1. Handouts -- Facilities Worksheet

2. Audiovisual -- Slide Projector - slides of different SOEP's

II. Presentation of Lesson

A. Motivation: Show slides -- discuss what it takes in facilities, equipment, and supplies to properly undertake each program shown.

B. Content Outline

1. Terms

   a. Facilities -- buildings and land that provide space for project completion

   b. Equipment -- tools of the trade, (i.e. -- feed troughs, buckets, or tractor)

   c. Supplies -- items consumed throughout the program (i.e. -- feed, fertilizer, wood, welding rods)

   d. Inventory -- list an approximate worth of all goods owned at any given time

   e. Financial statement -- a list of assets (what is owned) and liabilities (what is owed) to determine net worth of an individual

   f. Budget -- Prediction of costs (expenses) and receipts (income) of a program in order to determine potential success

2. For Each Enterprise and Project Selected

   a. Identify facilities necessary for entire year

   b. Identify equipment necessary for entire year

   c. Identify supplies necessary for entire year (Use reference books and resource people to accomplish) (Complete facilities worksheet)

3. Conduct Inventory of Student Assets

   a. List all items owned

   b. Give approximate worth of each item

   c. Decide which assets can be used for the various enterprises

4. Using Financial Statement from Student Records

   Determine cash on hand that can be used to begin the enterprises or projects

5. Identify Items to be Rented or Purchased from Parents
   a. Facilities
   b. Equipment
   c. Supplies

6. Identify Items to be Rented or Purchased from Others
   a. Facilities
   b. Equipment
   c. Supplies

7. Compute Total Amount of Money Needed for all Undertakings
   a. Initial Costs
   b. Ongoing Costs
   c. Total Needed for the Year

8. Methods of Acquiring Needed Capital (money)
   a. Parents
   b. Other Family Members
   c. FFA Chapter
   d. Bank or Savings and Loan
   e. PCA (Production Credit Association)
   f. Federal Land Bank
   g. Loan Company

9. Make Arrangements to Obtain Necessary Money
   a. Make appointment with loan officer
   b. Have available records and statements

            1) Financial Statement
            2) Budget and Cash Flow
            3) Previous Project Records
        c. Discuss Loan and Agree Upon
            1) Principal
            2) Interest Rate
            3) Repayment Plan
    10. Make Agreements and Arrangements for all Items Needed
        a. Money
        b. Facilities
        c. Equipment
        d. Supplies
        e. Transportation of:
            1) Self
            2) Equipment and Supplies to Project Site
            3) Products to Market

C. Suggested Student Activities
    1. Consult magazines and books to examine the needs of an enterprise (i.e., rabbits -- cages, water bottles, salt spools, feed, supplements, bedding, etc.)
    2. Completion of Enterprise Budgets and Facilities Worksheets
        a. Personal Inventory
        b. Farm Inventory
        c. Financial Statement

D. Study Questions

1. Describe the difference between facilities and equipment.
2. Name three sources of equipment for your major enterprise or project.
3. Name three sources of financial backing.
4. Distinguish between financial statement and a personal inventory.
5. Define budget.
6. Describe adequate facilities and equipment for your major enterprise.

INSTRUCTIONAL AREA: Orientation to Vocational Agriculture

INSTRUCTIONAL UNIT III: Developing and Improving the Individual Supervised Occupational Experience Program for Students in Vocational Agriculture

LESSON 3: Technical and Skill Jobs to Perform While Obtaining Work Experience

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Make needed changes in present and future SOEP activities to meet student objectives for skill development.

2. Specific:

a. Use worksheet to assess completion of general SOEP skills.
b. Use worksheet to assess completion of specific (individualized) SOEP skills.
c. List skills to be completed.
d. Determine SOEP activities that offer the opportunity to master these skills.
e.

f.

g.

B. Review of Teaching Materials

Phipps, Lloyd J. Handbook on Agricultural Education in Public Schools. 4th Edition, Danville, Ill.: The Interstate Printers and Publishers, 1980.

C. Special Arrangements

1. Worksheet -- SOEP - Skills

2. Work on a one to one basis each semester

II. Presentation of Lesson

A. Motivation -- Discuss the questions below:

1. What have you learned through your SOEP activities?

2. What is it that you want to learn to do?

B. Content Outline

1. All SOEP should provide opportunities for development in the following general areas:
   - a. develop a budget
   - b. accept responsibility
   - c. calculate hours worked
   - d. plan activities
   - e. work safely
   - f. keep appropriate records
   - g. prepare a financial statement
   - h. take an inventory
   - i. evaluate activities or enterprises
   - j.
   - k.
   - l.
2. Many SOEPs will provide the opportunity for
   - a. interviewing for a job
   - b. writing a resume
   - c. writing a letter of application
   - d. completing a job application
   - e. obtaining financing
   - f. renting equipment or facilities
   - g. buying equipment or facilities
   - h. preparing a bill of materials
   - i. ordering supplies
3. Each individual activity will provide different specific experiences. These skills will vary from student to student because of the experiences that are unique

to each student's SOEP. Examples of these types of experiences are:

   a. stocking shelves

   b. pricing stock

   c. selling stock

   d. using a cash register

   e. calculating and giving refunds

   f. ordering stock

   g. weighing and calculating price of stock

4. Skills mastered should be compared with those needed by students in reaching their occupational choice.

   a. Plan future SOEPs that will provide for the needed skills.

   b. Record all skills and the degree of achievement after each is completed.

C. Suggested Student Activities

   1. Complete SOEP skills worksheet and FFA Record Book as activities are planned and completed with the help of the instructor.

   2. Teacher may add skills to any worksheet to adapt to the specific situations. Some active students may complete 4-5 pages of specific skills.

SOEP SKILLS WORKSHEET

Teacher Evaluation Scale: Excellent....1, Good....2, Fair....3

1. General Skills Performance Evaluation

	Date of Completion	Hours of Practice	Teacher Evaluation
a. Develop a budget			
b. Accept responsibility			
c. Calculate hours worked			
d. Plan activities			
e. Work safely			
f. Keep appropriate records			
g. Prepare a financial statement			
h. Take an inventory			
i. Evaluate activities or enterprises			
j.			
k.			
l.			
m.			
n.			

SOEP SKILLS WORKSHEET

Teacher Evaluation Scale: Excellent....1, Good....2, Fair....3

2. Optional Skills Performance Evaluation

	Date of Completion	Hours of Practice	Teacher Evaluation
a. Job interviews			
b. Writing a resume			
c. Writing a letter of application			
d. Completing a job application			
e. Obtaining financing			
f. Renting equipment and facilities			
g. Buying equipment and facilities			
h. Preparing a bill of materials			
i. Ordering supplies			
j.			
k.			
l.			
m.			
n.			

SOEP SKILLS WORKSHEET

Teacher Evaluation Scale: Excellent....1, Good....2, Fair....3

3. Specific Individualized Skills Listing and Evaluation

	Date of Completion	Hours of Practice	Teacher Evaluation
I.E.--Stocking shelves --Pricing stock --Selling stock --Using a cash register			
a.			
b.			
c.			
d.			
e.			
f.			
g.			
h.			
i.			

INSTRUCTIONAL AREA: Agricultural Leadership

INSTRUCTIONAL UNIT I: Introduction to the Future Farmers of America

LESSON 1: Introduction to the history, aims and purposes, and significance to the FFA.

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Describe the aims and objectives of the FFA, the criteria for membership and the significance of FFA activities to the total vocational agricultural program.

2. Specific: Upon completion of this unit the student should be able to:

a. Define the term FFA.
b. Write a short paragraph describing how the FFA relates to the total agricultural education program.
c. List 10 of the important dates and corresponding events listed under the chronological history of the FFA from the official FFA manual.
d. State the primary aim of the FFA.
e. List the 12 specific purposes for which the FFA organization was formed.
f. Explain the meaning of each of the five symbols in the FFA National Emblem.
g. List the requirements of the different types of FFA membership.
h.

i.

j.

B. Review Teaching Material

1. Phipps, Lloyd J. Handbook on Agricultural Education in Public Schools. Danville, Ill.: Interstate Printers and Publishers, Inc., 1980.

2. FFA Advisor's Handbook. National FFA Foundation. Alexandria, Va.: National FFA Supply Service, 1975.

3. Advisory Teaching Guide on Vocational (FFA) Agriculture, Larry Selland and Dennis Torrence, 1968-1969 FFA Fellows. Alexandria, Va.: Future Farmer of America and Massey Ferguson, 1969.

4. Official FFA Manual. Future Farmers of America. Alexandria, Va.: National FFA Supply Service, 1981.

5. Student Handbook FFA. National FFA Foundation. Alexandria, Va.: National FFA Supply Service, 1975.

6. Slides -- "The Extra Teacher" -- National FFA Supply Service.

C. Special Arrangements

1. FFA Official manual will be made available for students.

2. Order Films -- FFA - "The Learning and Land," "Youth with a Purpose," "50th Anniversary Special - FFA at 50," Venard Films, LTD., Peoria, Ill. 61611.

3. Make arrangements with local radio station to use tape recording during FFA week.

D. Material Required

Cassette tape recorder, blank cassette tapes, assorted colored poster board, lettering stencils, colored markers, scissors, tape, and thumb tacks.

II. Presentation of Lesson

A. Motivation

1. Discuss the privileges and advantages of FFA membership.

2. Display the jackets and coats bearing the FFA insignia. 3

3. Show Slides -- "The Extra Teacher"

B. Content Outline

1. History (Background)

a. The Smith-Hughes Act in 1917 provided funds for the teaching of vocational agricultural schools.

b. The Future Farmers of America (FFA) is the national organization of, by, and for students of vocational agriculture and agribusiness.

c. Agriculture clubs were developed because of a common spirit of comradeship and love for farming and rural life among students in vocational education.

d. Though these early agriculture clubs were social and recreational in nature, some focus was placed also on education, self-improvement, and cooperation.

e. The idea for a statewide organization grew from a need for the increased number of active local units to band together.

f. The Future Farmers of Virginia and other state organizations were models for the developing of the National FFA.

g. The FFA was eventually organized in 1928 in Kansas City, Missouri, with 18 states represented.

h. Leslie Applegate with the first national president.

i. The NFA merged with the FFA in 1965 making total membership approximately 454,000 members in 10,000 chapters.

(Other important dates can be found in the latest official FFA manual.)

2. Aims and Objectives

a. The FFA encourages entrepreneurship and increases employability of its members.

b. The primary aim of the FFA is the development of agricultural leadership, cooperation, and citizenship. 5

c. The 12 specific objectives of the FFA are: (Transparency I-1-A)

   1) To develop competent leadership.

   2) To create and nurture a love for country life.

   3) To strengthen the confidence of the students in vocational agriculture, in themselves, and in their work.

   4) To create an interest in the intelligent choice of agricultural occupations.

   5) To encourage members in the development of individual farming programs and to establish their agricultural careers.

   6) To encourage members to improve the farm home and its surroundings.

   7) To participate in worthy undertakings for the improvement of agriculture.

   8) To develop character, train for useful citizenship, and foster patriotism.

   9) To participate in cooperative effort.

   10) To encourage and practice thriftiness.

   11) To encourage improvement in scholarship.

   12) To provide and encourage the development of organized rural recreational activities.

d. Wearing the FFA jacket involves knowledge of rules for proper use of it.

e. The FFA is considered an intracurricular activity of Vocational Agriculture. The FFA contest and awards program provide practical experience for several classroom activities. Proficiency awards encourage proficiency in production, management, and employment skills.

3. FFA Emblem (Transparency I-1-B through I-1-G)

    a. Cross section of an ear of corn -- Represents common agricultural interests since corn is native to America and is grown in every state.

    b. Rising Sun -- Signifies progress and the new day that will dawn when all farmers are educated and have learned to cooperate.

    c. The Plow -- Symbol of labor and tillage of the soil.

    d. The Eagle -- Signifies the national scope of the organization.

    e. The Owl -- Symbol of knowledge and wisdom.

4. Membership

    a. The active members of the FFA must:

        1) Be regularly enrolled in a vocational agricultural course, or have completed all vocational agricultural course offerings.

        2) Be between the ages of 14 and 21.

        3) Be in good standing with the local chapter.

    b. Alumni -- membership open to former FFA and NFA members, collegiate FFA members, present and former vocational agriculture teachers, parents of FFA members, and others interested in FFA.

    c. Collegiate membership -- membership may include students enrolled in agricultural courses and former active members of chartered local chapters who are enrolled in two- and four-year institutions.

d. Honorary membership -- any person in the community who has helped to advance vocational agriculture in the FFA may be elected to honorary membership by a majority vote of the members present at any regular meeting or convention.

C. Suggested Student Activities

1. Have the students participate in a recruitment assembly for eighth grade students giving a brief history and explanation of the FFA organization.

2. Have the students construct bulletin board displays stating and illustrating objectives, aims, and purposes of FFA.

3. Have the students select three of the objectives of the FFA and write one page on each of them describing how these relate to the enhancement of vocational agriculture.

4. Have the students make a mobile and/or model of each symbol in the FFA Emblem and its meaning culminating in a final picture of the complete FFA Emblem. This will be hung in the classroom area.

5. Have the students develop a crossword puzzle using information dealing with the chronological history of the FFA found in the official manual. They will give their puzzle to a designated partner to be completed.

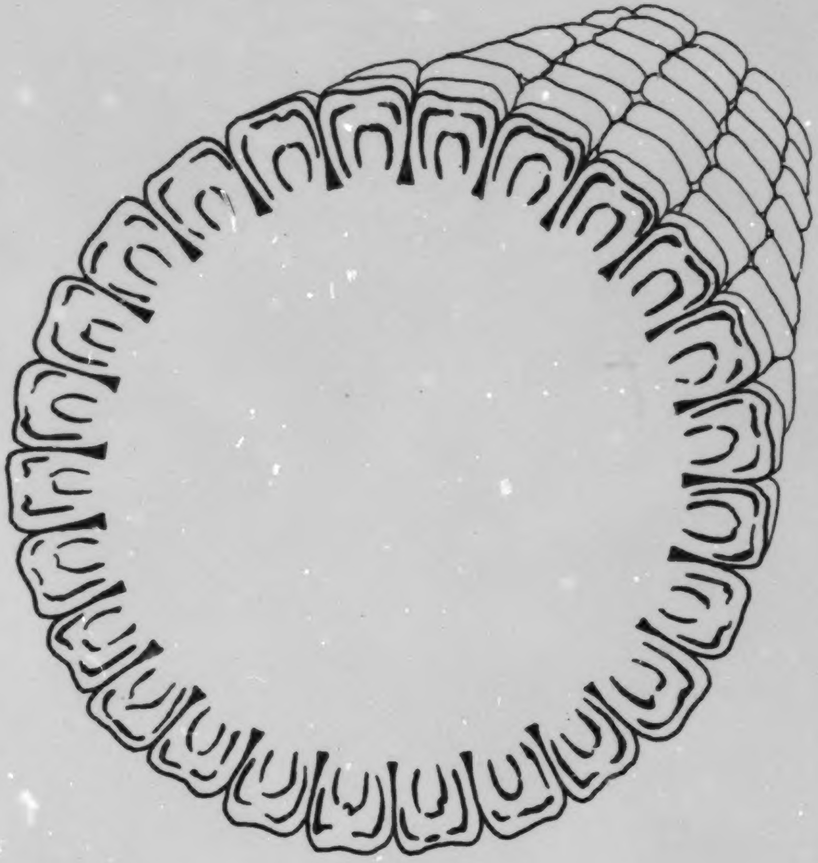
6. Ask the students to write and tape radio spots for FFA week telling a brief history of the FFA and its service to agriculture to be used on the local radio station.

12 SPECIFIC OBJECTIVES OF THE FFA

1. To DEVELOP COMPONENT LEADERSHIP.
2. To CREATE AND NURTURE A LOVE FOR COUNTRY LIFE.
3. To STRENGTHEN THE CONFIDENCE OF THE STUDENTS IN VOCATIONAL AGRICULTURE, IN THEMSELVES, AND THEIR WORK.
4. To CREATE AN INTEREST IN THE INTELLIGENT CHOICE OF AGRICULTURE OCCUPATIONS.
5. To ENCOURAGE MEMBERS IN THE DEVELOPMENT OF INDIVIDUAL FARMING PROGRAMS AND ESTABLISH THEIR AGRICULTURAL CAREERS.
6. To ENCOURAGE MEMBERS TO IMPROVE THE FARM HOME AND ITS SURROUNDINGS.
7. To PARTICIPATE IN WORTHY UNDERTAKINGS FOR THE IMPROVEMENT OF AGRICULTURE.
8. To DEVELOP CHARACTER, TRAIN FOR USEFUL CITIZENSHIP, AND FOSTER PATRIOTISM.
9. To PARTICIPATE IN COOPERATIVE EFFORT.
10. To ENCOURAGE AND PRACTICE THRIFTINESS.
11. To ENCOURAGE IMPROVEMENT IN SCHOLARSHIP.
12. To PROVIDE AND ENCOURAGE THE DEVELOPMENT OF ORGANIZED RURAL RECREATIONAL ACTIVITIES.

TRANSPARENCY I-1-A

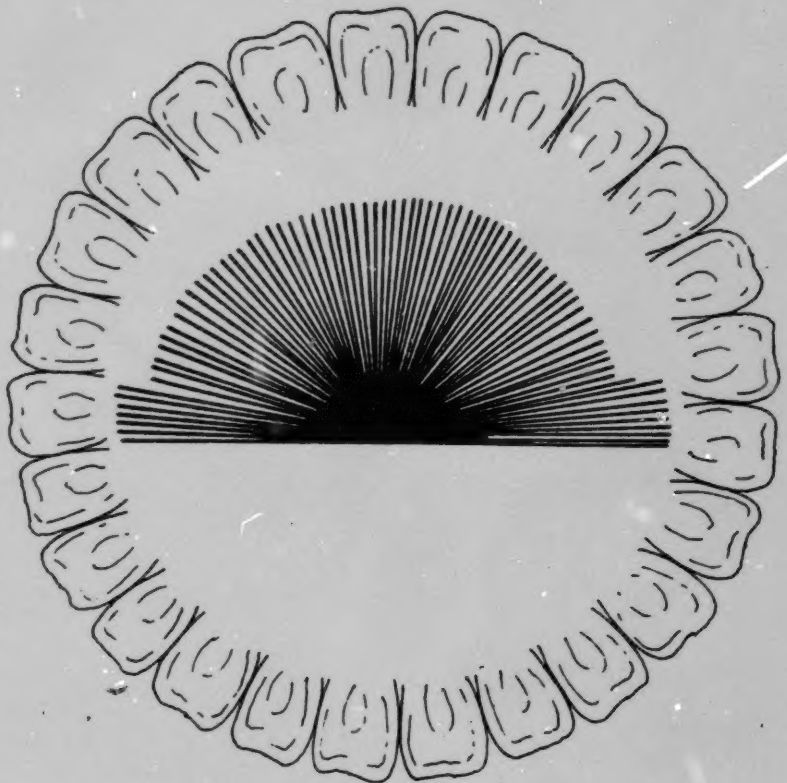
THE FFA EMBLEM



A cross-section of an ear of corn is the background. Corn represents our common agricultural interests, is native to America and is grown in every state.

Transparency I-1-B

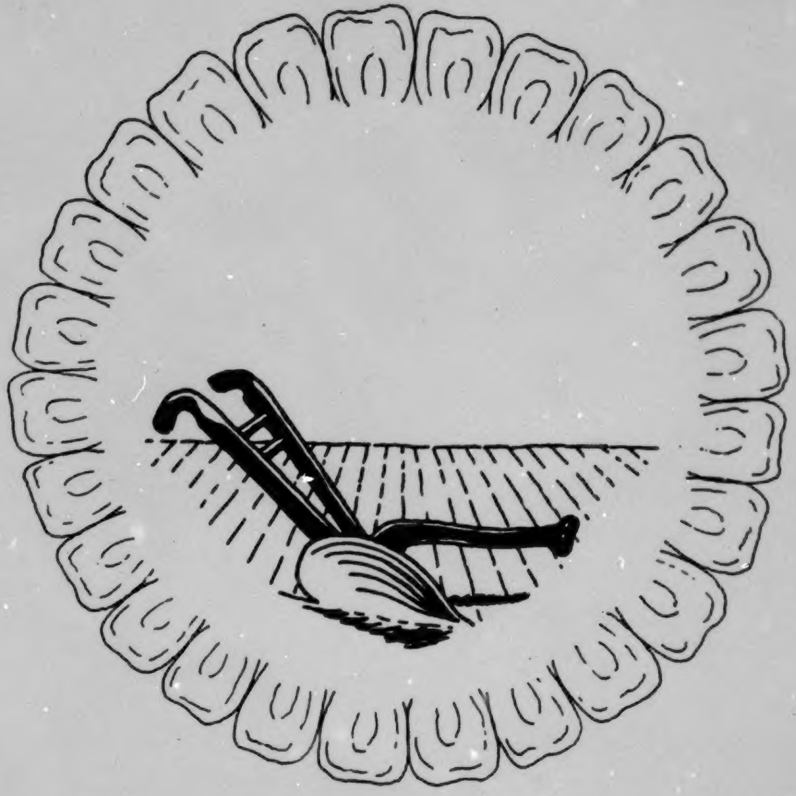
THE FFA EMBLEM



The rising sun, in the center of the emblem, symbolizes progress in agriculture and the confidence that all FFA members have in the future.

Transparency I-1-C

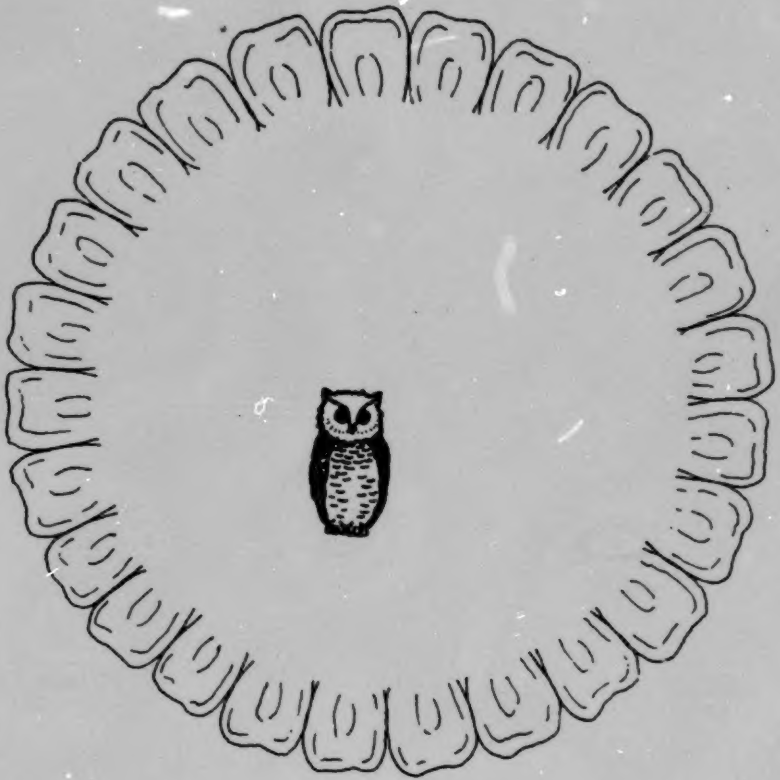
THE FFA EMBLEM



The plow is the symbol of labor and tillage of the soil.

Transparency I-1-D

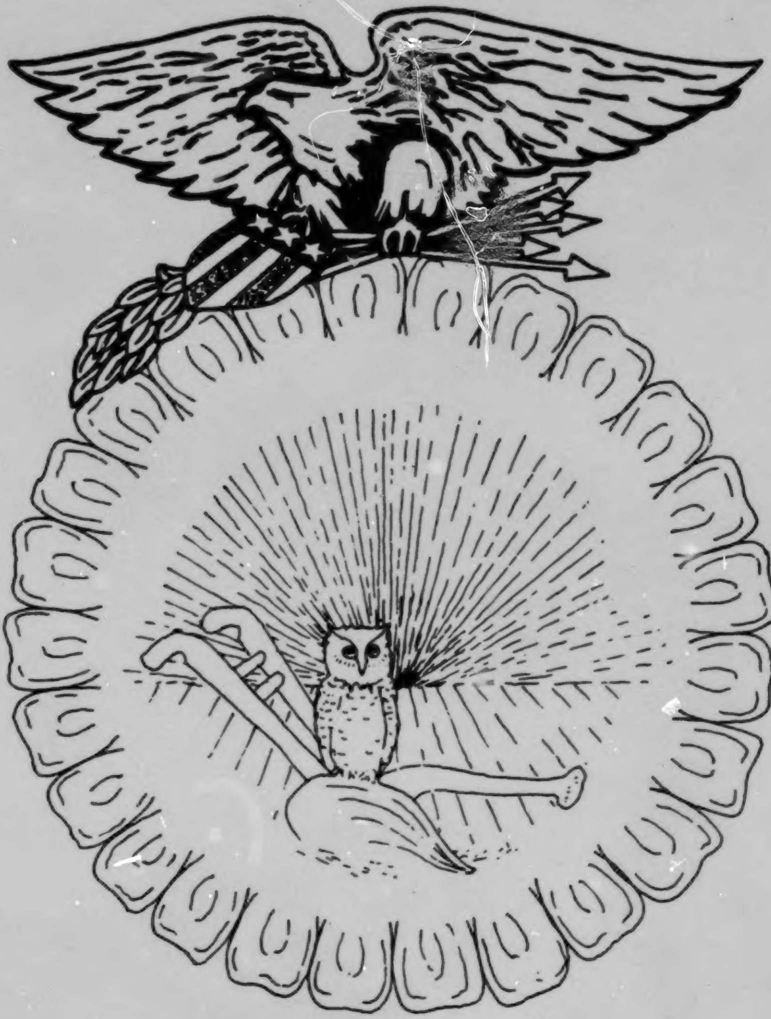
THE FFA EMBLEM



The owl is the symbol of wisdom and knowledge.

Transparency I-1-E

THE FFA EMBLEM

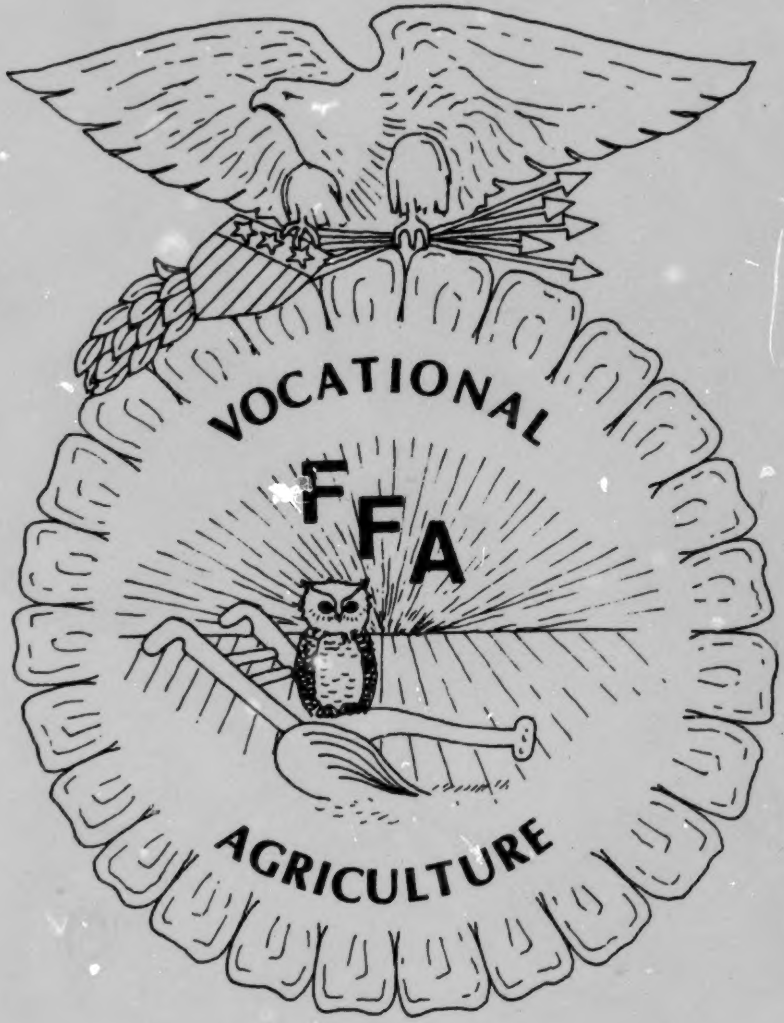


The eagle is symbolic of the

National scope of the FFA.

Transparency I-1-F

THE FFA EMBLEM


VOCATIONAL
FFA
AGRICULTURE

The words "Vocational Agriculture" surrounding the letters "FFA" tells us that FFA is an important part of the vocational agriculture/agribusiness program.

INSTRUCTIONAL AREA: Agricultural Leadership

INSTRUCTIONAL UNIT I: Introduction to the FFA

LESSON 2: Becoming familiar with the FFA creed, motto, official dress, FFA colors, and degree advancement.

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Identify the four degrees of membership, recite the creed and motto of the FFA, and describe the proper wearing of the FFA jacket.

2. Specific:

a. Describe the requirements for each of the four degrees of active membership (i.e. Greenhand, Chapter Farmer, State Farmer, and American Farmer degrees).
b. Recite the FFA motto and FFA salute to the satisfaction of the teacher.
c. Memorize and interpret the FFA creed.
d. List the 6 rules for wearing the official FFA jacket.
e.

f.

g.

B. References

1. Official FFA Manual, Future Farmers of America. Alexandria, Va.: National FFA Supply Service, 1981.

2. Student Handbook--FFA. National FFA Foundation. Alexandria, Va.: National FFA Supply Service, 1977.

3. Bender, Ralph A., Robert Taylor, Chester Hanson, and L.H. Newcomb. The FFA and You. Danville, Ill.: Interstate Printers and Publishers, 1979.

4. State and American Farmer Degree Applications

5. FFA Advisor's Handbook. National FFA Foundation. Alexandria, Va.: National FFA Supply Service, 1975.

6. Official FFA Supply Catalog. Alexandria, Va.: National FFA Supply Service, 1982.

C. Special Arrangements

1. Invite a State Farmer or an American Farmer to speak to the class on the activities which led to achieving the degree.

2. Have the four degree pins and symbols on display.

3. Obtain Chapter Farmer, State Farmer, and American Farmer degree application forms.

4. Display an FFA jacket.

D. Materials Required

1. Colored poster board

2. Scissors

3. Markers

4. Stencils

II. Presentation of Lesson

A. Motivation

1. Let students examine the pins and symbols representing the degrees of advancement before beginning the lesson.

2. Give students application forms for Greenhand degrees and furnish them with directions on how they should be filled out. This will provide students with an up-to-date record for preparing the official application.

3. Students receiving degrees should be honored at the appropriate ceremony and have their names listed in the local newspaper along with a group picture. 10

4. Post pictures of students receiving various degrees on school and FFA bulletin boards.

5. Show the students the FFA jacket.

B. Content Outline

1. To earn the Greenhand Degree, the student must: (Transparency I-2-A)
    a. Be regularly enrolled in a vocational agriculture class.
    b. Have satisfactory plans for conducting a supervised occupational experience program.
    c. Learn the FFA creed, motto, and salute.
    d. Describe the FFA emblem colors and symbols.
    e. Explain the proper use of FFA jacket and blazer.
    f. Have a satisfactory knowledge of the background of the FFA.
    g. Describe the duties and responsibilities of FFA members.
    h. Have access to the official FFA manual.
    i. Submit written application for the degree for chapter records.
2. To receive the Chapter Farmer degree, the member must: (Transparency I-2-B)
    a. Be a recipient of the Greenhand degree and complete one year of vocational agriculture classes.
    b. Have a supervised occupational program in operation.
    c. Be regularly enrolled in a vocational agriculture class.
    d. Demonstrate satisfactory knowledge of the local chapter constitution and be involved in at least three chapter activities.
    e. Have earned $50 in SOEP or worked 50 hours in a directed laboratory.
    f. Demonstrate ability to effectively lead a group discussion for 15 minutes.

g. Demonstrate five parliamentary procedure abilities. 12

h. Demonstrate progress toward achievement of a proficiency award.

i. Have satisfactory scholastic record in agriculture courses.

3. To receive the State Farmer degree, the member must: (Transparency I-2-C)

a. Have already received the two previous degrees.

b. Be an active member of the FFA and have completed at least 24 months of vocational agriculture instruction.

c. Have earned $500 from a supervised occupational experience program.

d. Demonstrate leadership ability in public speaking and parliamentary procedure.

1) Perform 10 parliamentary procedure abilities,
2) Give a five minute speech, and
3) Serve as officer and/or chairman or participating member of a major committee.

e. Have satisfactory scholastic record.

f. Participate in planning and completion of chapter program of activities.

g. Participate in five FFA activities above chapter level.

h. Pass a written examination.

4. To receive the American Farmer degree, the member must: (Transparency I-2-D)

a. Be the recipient of the Greenhand, Chapter Farmer, and State Farmer degrees.

b. Be active in the FFA and have completed at least three full school years of vocational agriculture.

c. Have in operation a SOEP from which $1000 was earned and productively invested.

d. Demonstrate outstanding leadership abilities and possess satisfactory scholastic average.

5. THE FFA MOTTO

Learning to Do
Doing to Learn
Earning to Live
Living to Serve

6. THE SALUTE

The pledge of allegiance is the official salute of the organization. With the right hand over the left breast and facing the flag of the United States, members will recite:

I pledge allegiance to the flag,
Of the United States of America;
And to the Republic for which it
  stands,
One Nation, under God, indivisible,
With liberty and justice for all.

7. THE FFA CREED

I believe in the future of farming with a faith born not of words, but of deeds--achievements won by the present and past generations of agriculturists; in the promise of better days through better ways, even as the better things we now enjoy have come to us from the struggles of former years.

I believe that to live and work on a good farm, or to be engaged in other agricultural pursuits, is pleasant as well as challenging; for I know the joys and discomforts of agricultural life and hold an inborn fondness for those associations which, even in hours of discouragement, I cannot deny.

I believe in leadership from ourselves and respect from others. I believe in my own ability to work efficiently and think clearly, with such knowledge and skill as

I can secure, and in the ability of progressive agriculturists to serve our own and the public interest in producing and marketing the product of our toil.

I believe in less dependence on begging and more power in bargaining; in the life abundant and enough honest wealth to help make it so--for others as well as myself; in less need for charity and more of it when needed; in being happy myself and playing square with those whose happiness depends upon me.

I believe that rural America can and will hold true to the best traditions of our national life and that I can exert an influence in my home and community which will stand solid for my part in the inspiring task.

8. FFA COLORS

a. National blue

b. Corn gold

9. The official dress for female members is black skirt, white blouse with official FFA blue scarf, black shoes and official jacket zipped to the top. (Transparency I-2-E)

The official dress for male members is black slacks, white shirt, blue FFA tie, black shoes and socks and the official jacket zipped to the top.

Rules for proper use of the jacket are:

a. Jacket should be worn only by members.

b. It should be kept neat and clean.

c. The jacket should have one large emblem on the back and one small emblem on the front; the name of state association and local chapter on the back; and the name of the member and one office or honor on the front.

d. On official occasions, the collar should be turned down, cuffs buttoned, and zipper fastened to the top.

e. The jacket should be worn to all official occasions and to school or other appropriate places.

f. The jacket should only be worn to places appropriate for members to visit.

g. School letters or insignias of other organizations should not be worn on this jacket.

h. When jacket becomes faded and worn, emblems and lettering should be removed and the jacket discarded.

i. Emblems and lettering are to be removed if the jacket is given or sold to a non-member.

j. A member always acts like a lady or gentleman when wearing the jacket.

k. Members should refrain from use of tobacco and alcohol while wearing the FFA jacket or officially representing the organization.

l. All chapter degree, officer, and award medals should be worn beneath the name on the right side of the jacket, with the exception that a State Farmer charm and American Farmer key should be worn above the name or attached to a standard key chain. No more than three medals should be worn on the jacket. These should be the highest degree earned, the highest office held, and the highest award earned by the member.

10. The proper procedure for tying a tie is: (Transparency I-2-F&G)

    a. Start with the wide end of the tie on your right and extending a foot below the narrow end.

    b. Cross the wide end over the narrow and bring up through the loop.

    c. Bring the wide end down, around behind the narrow end, and up on your right.

   d. Then put down through loop and around across the narrow part of the tie.

   e. Turn and pass up through the loop.

   f. Complete by slipping down through the knot in front. Tighten and draw up snug to collar.

C. Student Activity

1. Each student recite the FFA motto, the FFA creed, and the FFA salute.

2. Each student select one paragraph from the FFA creed and explain its meaning on a written exercise.

3. Each student participates in a creed speaking contest in class. Extra points will be given to all members, but more will be given to the winner. The number of extra points will be left to the discretion of the instructor.

4. Students participate in a mock ceremony awarding the four degrees.

5. Candidates for each degree participate in building a bulletin board or display to educate the school and the community about the particular degree and its requirements.

6. Students recite the FFA motto and the FFA creed in class. This should be conducted by setting up a lectern in front of the class and allowing the student to stand behind the lectern for the recitations.

7. The students design and make a poster or bulletin board display illustrating proper use of FFA jacket. Improper use can be represented by the student in an additional exercise.

8. Have an in-class demonstration with one student demonstrating the proper wearing of the FFA jacket according to the FFA regulations.

REQUIREMENTS
FOR
GREENHAND DEGREE

1. BE REGULARLY ENROLLED IN A VOCATIONAL AGRICULTURE CLASS.
2. HAVE SATISFACTORY PLANS FOR CONDUCTING A SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAM.
3. LEARN THE FFA CREED, MOTTO, AND SALUTE.
4. DESCRIBE THE FFA EMBLEM COLORS AND SYMBOLS.
5. EXPLAIN THE PROPER USE OF FFA JACKET AND BLAZER.
6. HAVE A SATISFACTORY KNOWLEDGE OF THE BACKGROUND OF FFA.
7. DESCRIBE THE DUTIES AND RESPONSIBILITIES OF FFA MEMBERS.
8. HAVE ACCESS TO AN OFFICIAL FFA MANUAL.
9. SUBMIT WRITTEN APPLICATION FOR THE DEGREE FOR CHAPTER RECORDS.

TRANSPARENCY I-2-A

REQUIREMENTS
FOR
CHAPTER FARMER DEGREE

1. BE A RECIPIENT OF THE GREENHAND DEGREE AND COMPLETE ONE YEAR OF VOCATIONAL AGRICULTURE CLASSES.

2. HAVE A SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAM.

3. BE REGULARLY ENROLLED IN VOCATIONAL AGRICULTURE CLASS.

4. DEMONSTRATE SATISFACTORY KNOWLEDGE OF THE LOCAL CHAPTER CONSTITUTION AND BE INVOLVED IN AT LEAST 3 CHAPTER ACTIVITIES.

5. HAVE EARNED $50 IN A SOEP OR WORKED 50 HOURS IN A DIRECTED LABORATORY.

6. DEMONSTRATE ABILITY TO EFFECTIVELY LEAD A GROUP DISCUSSION FOR 15 MINUTES.

7. DEMONSTRATE 5 PARLIAMENTARY PROCEDURE ABILITIES.

8. DEMONSTRATE PROGRESS TOWARD ACHIEVEMENT OF PROFICIENCY AWARD.

9. HAVE A SATISFACTORY SCHOLASTIC RECORD.

TRANSPARENCY I-2-B

REQUIREMENTS
FOR
STATE FARMER DEGREE

1. Have received the Greenhand and Chapter Farmer degrees.

2. Be an active member of the FFA and complete at least 24 months of vocational agricultural instruction.

3. Have earned $500 or worked at least 600 hours in a SOEP.

4. Perform 10 parliamentary procedure abilities.

5. Give a 5-minute speech.

6. Serve as officer and/or chairman, or participating member of a major committee.

7. Maintain a satisfactory scholastic record.

8. Participate in planning and completion of chapter program of activities.

9. Participate in 5 FFA activities above the chapter level.

10. Must pass a written examination.

Transparency I-2-C

REQUIREMENTS
FOR
AMERICAN FARMER DEGREE

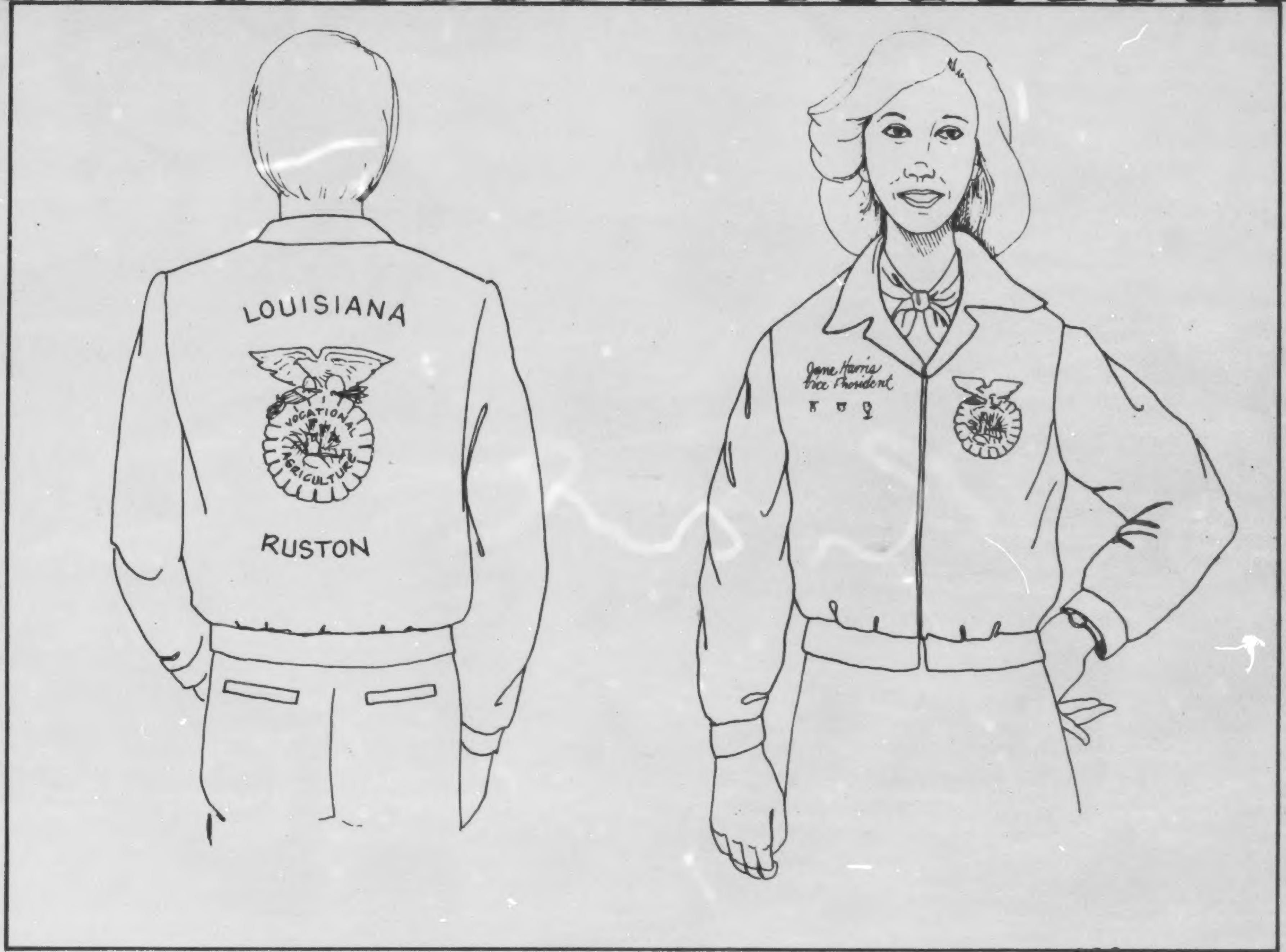
1. BE THE RECIPIENT OF THE GREENHAND, CHAPTER FARMER, AND STATE FARMER DEGREES.

2. BE ACTIVE IN THE FFA AND HAVE COMPLETED AT LEAST 3 FULL SCHOOL YEARS OF VOCATIONAL AGRICULTURE.

3. HAVE IN OPERATION A SOEP FROM WHICH $5,000 WAS EARNED AND PRODUCTIVELY INVESTED.

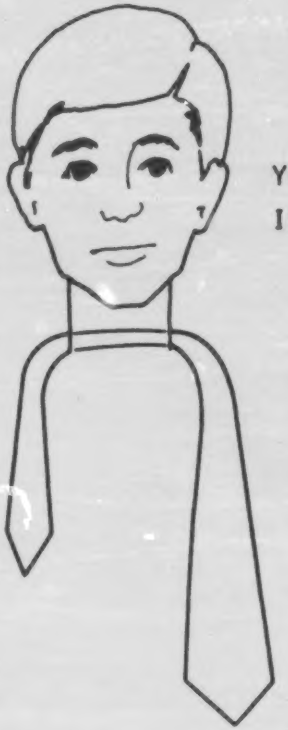
4. DEMONSTRATE OUTSTANDING LEADERSHIP ABILITY AND POSSESS A SATISFACTORY SCHOLASTIC AVERAGE.

TRANSPARENCY I-2-D


LOUISIANA
VOCATIONAL
FFA
AGRICULTURE
RUSTON
Jane Harris
Vice President

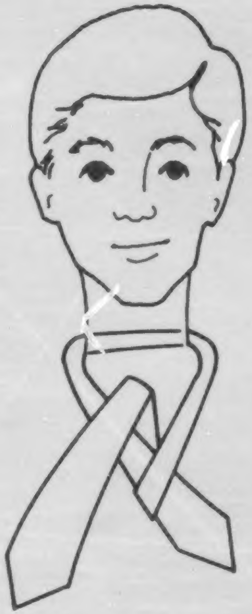
Transparency I-2-E

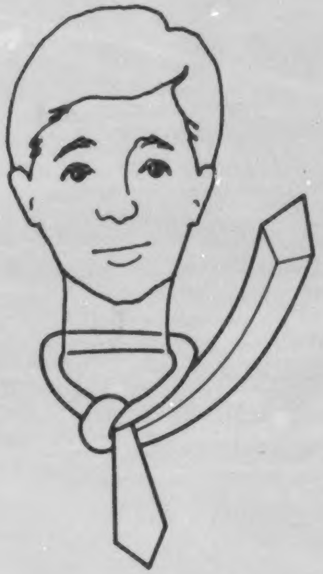
HOW TO TIE A TIE
WINDSOR KNOT


YOUR LEFT
IN MIRROR
YOUR RIGHT
IN MIRROR

START WITH WIDE END OF TIE ON YOUR RIGHT AND EXTENDING A FOOT BELOW NARROW END.

CROSS WIDE END OVER NARROW AND BRING UP THROUGH LOOP.



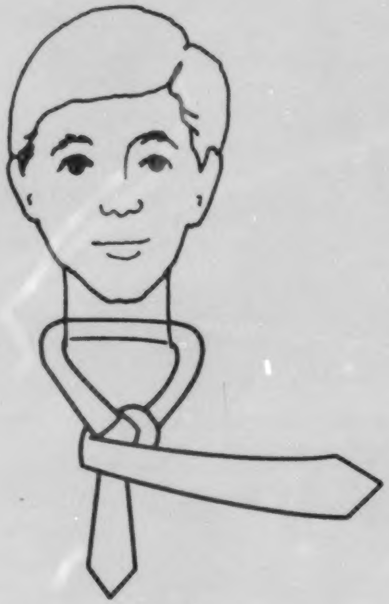


BRING WIDE END DOWN, AROUND BEHIND NARROW, AND UP ON YOUR RIGHT.

TRANSPARENCY I-2-F

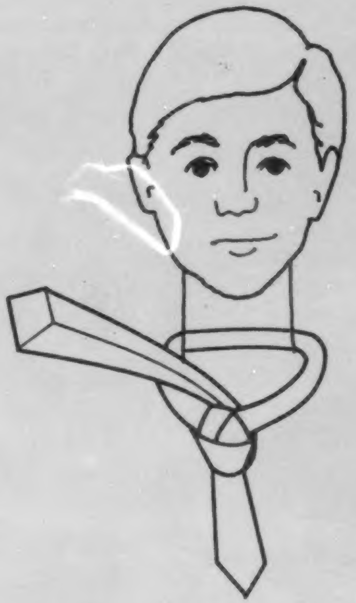
HOW TO TIE A TIE

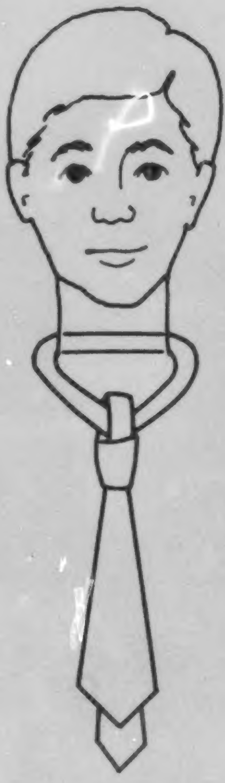
WINDSOR KNOT



THEN PUT DOWN THROUGH LOOP AND AROUND ACROSS NARROW AS SHOWN.

TURN AND PASS UP THROUGH LOOP AND . . .





COMPLETE BY SLIPPING DOWN THROUGH THE KNOT IN FRONT. TIGHTEN AND DRAW UP SNUG TO COLLAR.

INSTRUCTIONAL AREA: Agricultural Leadership

INSTRUCTIONAL UNIT I: Introduction to the FFA

LESSON 3: Responsibilities and Duties of FFA Officers

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Conduct a chapter meeting and list the duties and responsibilities of FFA chapter officers.

2. Specific:

a. Identify each office of the local FFA chapter.
b. Identify the paraphernalia that should be placed at each officer station.
c. List the duties and responsibilities of each of the chapter officers.
d. Set up a meeting room and assign officers to their respective stations.
e. Participate in opening and closing ceremonies.
f. List the order of business as given in the official FFA Manual.
g. List the 11 major divisions of the program of activities.
h.

i.

j.

B. Review of Teaching Materials

1. Official FFA Manual. Future Farmers of America. Alexandria, Va.: National FFA Supply Service, 1981.

2. Student Handbook - FFA. National FFA Foundation. Alexandria, Va.: National FFA Supply Service, 1977.

3. *FFA Advisor's Handbook*. National FFA Foundation. Alexandria, Va.: National FFA Supply Service, 1975.

4. Slides -- "Leadership FFA Leaders Speak" National FFA Supply Service.

5. Transparencies

    a. Officer duties

    b. Overlay of FFA Emblem

    c. Meeting room arrangement

    d. Gavel

    e. Order of business

    f. Major divisions of the program of activities

    g. Sample program of work

C. Special Arrangements

1. Class will observe the roles of officers during an advanced grade chapter meeting (in same school).

2. Individual class assignments to interview a specified chapter officer about his/her responsibilities and respective roles at chapter meetings.

3. Film of the most recent national FFA convention will be shown to the class (rent from Venard Films Ltd.).

4. Addresses by resource personnel from State or National FFA organizations indicating the responsibilities of various state and local chapter offices.

D. Materials Required -- paraphernalia for conducting FFA meeting; thumb tacks, slide projector and screen, 3x5 note cards for officer duties to be listed in student activity exercise.

E. Special Class Arrangements -- Rearrangement of classroom for conducting meeting of the FFA in accordance with the diagram (p. 16 of the 1980 FFA Manual or most recent edition).

II. Presentation of Lesson

A. Motivation

1. Each class member will be given an opportunity to preside over or act the role of an officer in one of the mock chapter meetings (opening and closing ceremonies for all FFA meetings pp. 26-29 of 1980 FFA Manual).
2. Show slides -- "Leadership - FFA Leaders Speak"
3. Show officer pins

B. Content Outline

Chapter Officers and Responsibilities
(Transparency of each officer's duties)

1. President -- Rising Sun (Transparency I-3-A)
   a. Presides over meetings according to accepted rules of parliamentary procedure.
   b. Appoints committees and serves as an ex officio member.
   c. Serves as the official representative of the chapter.
   d. Co-ordinates the activities of the chapter and keeps in touch with the progress of each division of the program of activities.
2. Vice-President -- The Plow (Transparency I-3-B)
   a. Assumes all duties of the president if it becomes necessary.
   b. Supervises all chapter committee operations.
   c. Works closely with the president in co-ordinating chapter activities.
3. Secretary -- The Ear of Corn (Transparency I-3-C)
   a. Prepares and presents the minutes of each meeting.
   b. Prepares the agenda for each meeting.
   c. Attends to chapter correspondence.
   d. Prepares, posts, and distributes motions.
   e. Compiles chapter reports.
   f. Keeps member attendance and activity records.
   g. Issues membership cards.

h. Has on hand for each meeting:

   1) Official Secretary's Handbook,
   2) Copy of program of activities,
   3) The official Manual, and
   4) Copies of the chapter constitution and by-laws.

4. Treasurer -- Bust of Washington (Transparency I-3-D)

   a. Receives and deposits FFA funds.

   b. Collects dues and assessments.

   c. Prepares and submits the membership roster and dues to the national organization in cooperation with the secretary.

   d. Maintains a neat and accurate official FFA Treasurer's book.

   e. Chairs the earnings and savings committees.

   f. Prepares monthly treasurer's reports for chapter meetings.

5. Reporter -- American Flag (Transparency I-3-E)

   a. Prepares a chapter newsletter and a reporter's scrap book.

   b. Releases news and information to local news media.

   c. Helps plan public information programs.

   d. Sends local stories to area, district, and state reporters.

   e. Sends articles and pictures to the National Future Farmer and Louisiana Future Farmer.

   f. Works with local media on radio and television appearances and FFA news.

6. Sentinel -- Shield of Friendship (Transparency I-3-F)

    a. Prepares the room and cares for the chapter equipment and supplies.

    b. Attends the door and welcomes visitors.

    c. Keeps the meeting room comfortable.

    d. Takes charge of candidates for degree ceremonies.

    e. Assists with special features and refreshments.

7. Parliamentarian

    a. Assists the secretary with the minutes.

    b. Assists with parliamentary decisions.

8. Advisor -- The Owl (Transparency I-3-G)

    Role as suggested in the Advisor's Handbook published by Merck Company, 1975.

9. Opening and Closing Ceremonies (see official FFA Manual)

    a. Read and discuss each officer's part in the opening and closing ceremonies as stated in the official FFA Manual.

    b. State reasons why this part of the FFA meeting is important.

        1) Creates confidence in chapter officers.
        2) Develops sense of organization, direction, and leadership in all FFA members present.
        3) Prepares all members to think about matters to be discussed in the meeting.
        4) Serves as a reminder of the traditions and purposes of the FFA.

10. Meeting Room Arrangement (Transparency I-3-H)

    The meeting room is to be arranged according to the diagram given in the official FFA Manual. This includes the proper placement of paraphernalia at each officer's station prior to and during FFA meetings. 23

11. Order of Business (Transparency I-3-I)

    a. Opening ceremony

    b. Minutes of the previous meeting

    c. Officer reports

    d. Report on chapter program of activities

    e. Special features

    f. Unfinished business

    g. Committee Report

        1) Major division of the program activities
        2) Special

    h. New business

    i. Degree and installation ceremonies

12. Use of the Gavel (Transparency I-3-J)

    a. One tap

        1) Follow announcement of vote
        2) Signal to be seated
        3) Follow announcement that a meeting is adjourned

    b. Two taps -- call the chapter meeting to order

    c. Three taps -- signal for all members to stand during opening and closing ceremonies.

13. Major Divisions of the Program of Activities (Transparency I-3-K)

    a. Supervised Agricultural Occupational Experience

    b. Cooperation

    c. Community Service

    d. Leadership

    e. Earnings, Savings, and Investments

    f. Conduct of Meetings

    g. Scholarship

    h. Recreation

    i. Public Relations

    j. Participation in State and National Activities

    k. Alumni Relations

C. Suggested Student Activities

1. Students list the various chapter officers.

2. Each student selects one office and develops an outline of activities he/she would do to improve and expand the local FFA chapter if elected to that office. These activities would be in conjunction with the duties of that office.

3. Divide the class into officer teams with seven members on each team. The number of these teams will vary depending on class size. Each team will arrange the classroom placing the officer symbols at the proper station as a meeting room. Each team will select students to fill each officer position. These teams will conduct the opening and closing ceremonies by memory in a class exercise.

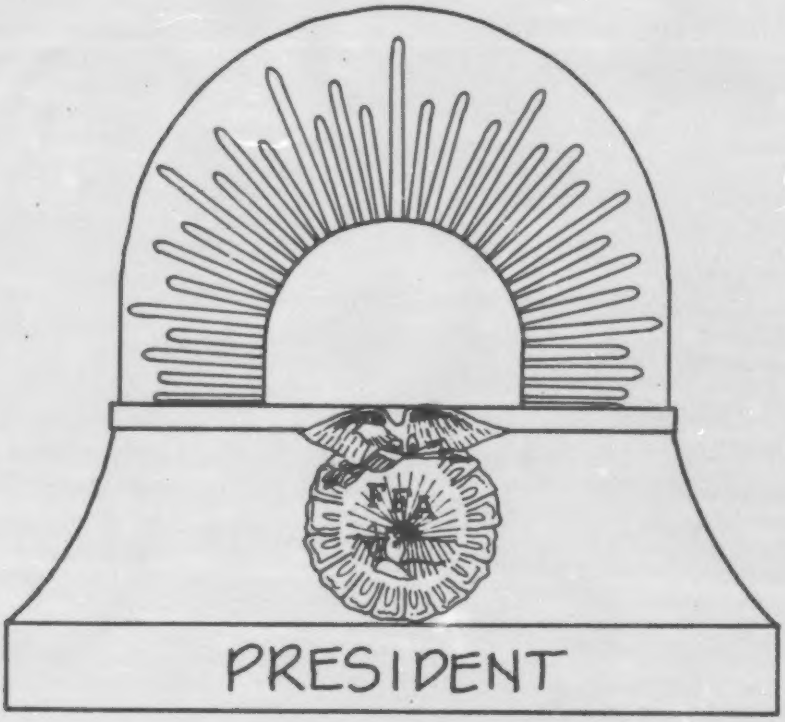
4. The students will elect a new set of officers every week for six weeks. These officers will open and close each class period with the opening and closing ceremonies. This will give all students opportunity to participate in carrying out this official function as a chapter officer.

5. All officer positions labeled on poster board strips will be attached to the bulletin board. Cards with all the duties of each officer printed on them will be shuffled and put in a box. Each student will

then draw one duty out of the box and pin that duty under the officer position that corresponds to that job.

6. Each student will select a major division of the program of activities on which to serve for the year.

7. Each student will list the 11 major divisions of the program of activities.



DUTIES & RESPONSIBILITIES

Presides over meetings according to accepted rules of parliamentary procedure.

Appoints committees and serves as an ex-officio member.

Serves as the official representative of the chapter.

Coordinates the activities of the chapter and keeps in touch with the progress of each division of the program of activities.

Transparency I-3-A

FFA
VICE PRESIDENT

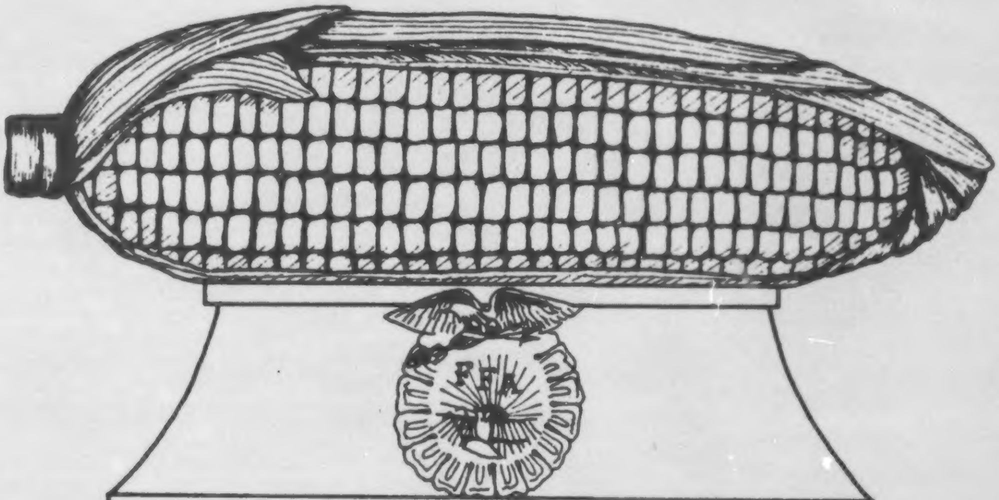
DUTIES & RESPONSIBILITIES

Assumes all duties of the president if it becomes necessary.

Supervises all chapter committee operations.

Works closely with the president in coordinating chapter activities.

Transparency I-3-B



SECRETARY

DUTIES & RESPONSIBILITIES

Prepares and presents the minutes of each meeting.

Prepares the agenda for each meeting.

Attends to chapter correspondence.

Prepares, posts, and distributes motions.

Compiles chapter reports.

Keeps member attendance and activity records.

Issues membership cards.

Has on hand for each meeting:

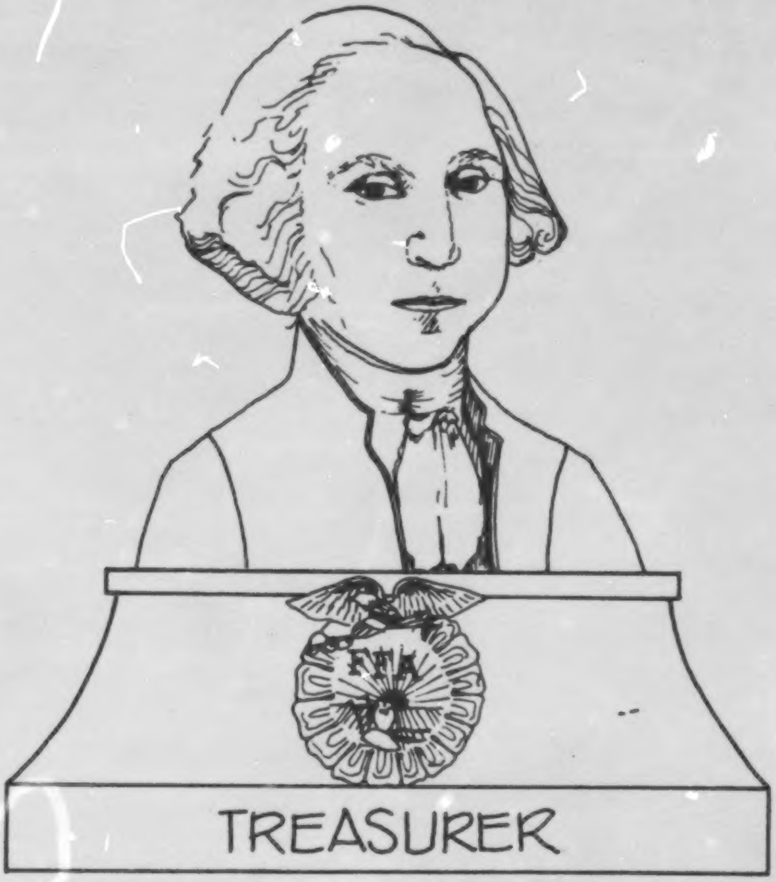
(a) official secretary's handbook.

(b) copy of program of activities.

(c) the official manual.

(d) copies of the chapter constitution and by-laws.

Transparency I-3-C



DUTIES & RESPONSIBILITIES

Receives and deposits FFA funds.

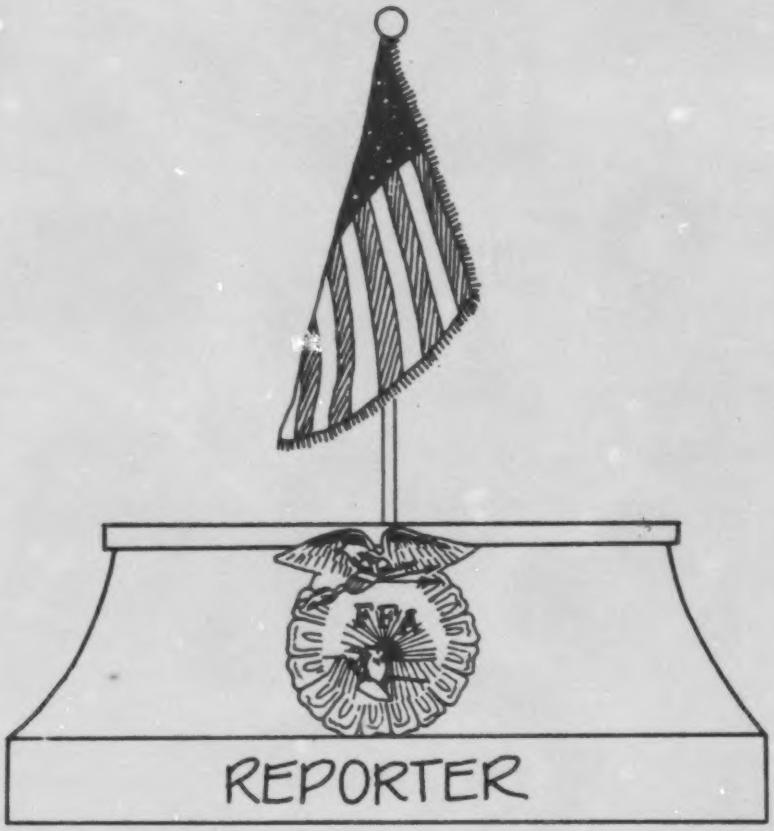
Collects dues and assessments.

Prepares and submits the membership roster and dues to the national organization in cooperation with the secretary.

Maintains a neat and accurate official FFA treasurer's book.

Chairs the earnings and savings committee.

Prepares monthly treasurer's reports for chapter meetings.



DUTIES & RESPONSIBILITIES

Prepares a chapter newsletter and a reporter's scrapbook.

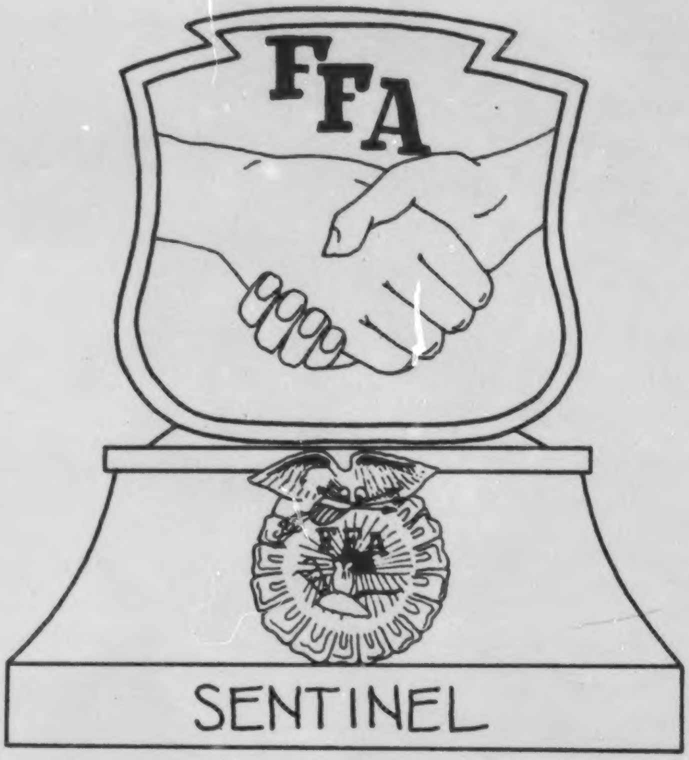
Releases news and information to local news media.

Helps plan public information programs.

Sends local stories to area, district, and state reporters.

Sends articles and pictures to the National Future Farmer and State Future Farmer.

Works with local media on radio and television appearances and FFA news.



DUTIES & RESPONSIBILITIES

Prepares the room and cares for the chapter equipment and supplies.

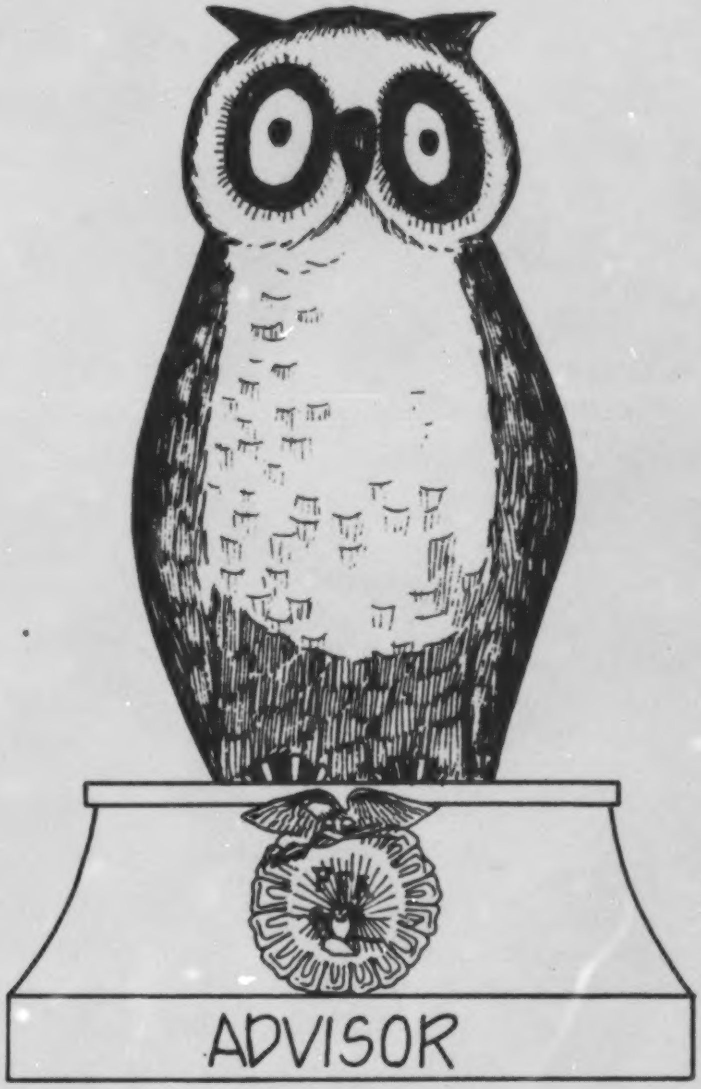
Attends the door and welcomes visitors.

Keeps the meeting room comfortable.

Takes charge of candidates for degree ceremonies.

Assists with special features and refreshments.

Transparency I-3-F



DUTIES & RESPONSIBILITIES

Teach classes.

Supervise all FFA activities.

Provide leadership instruction.

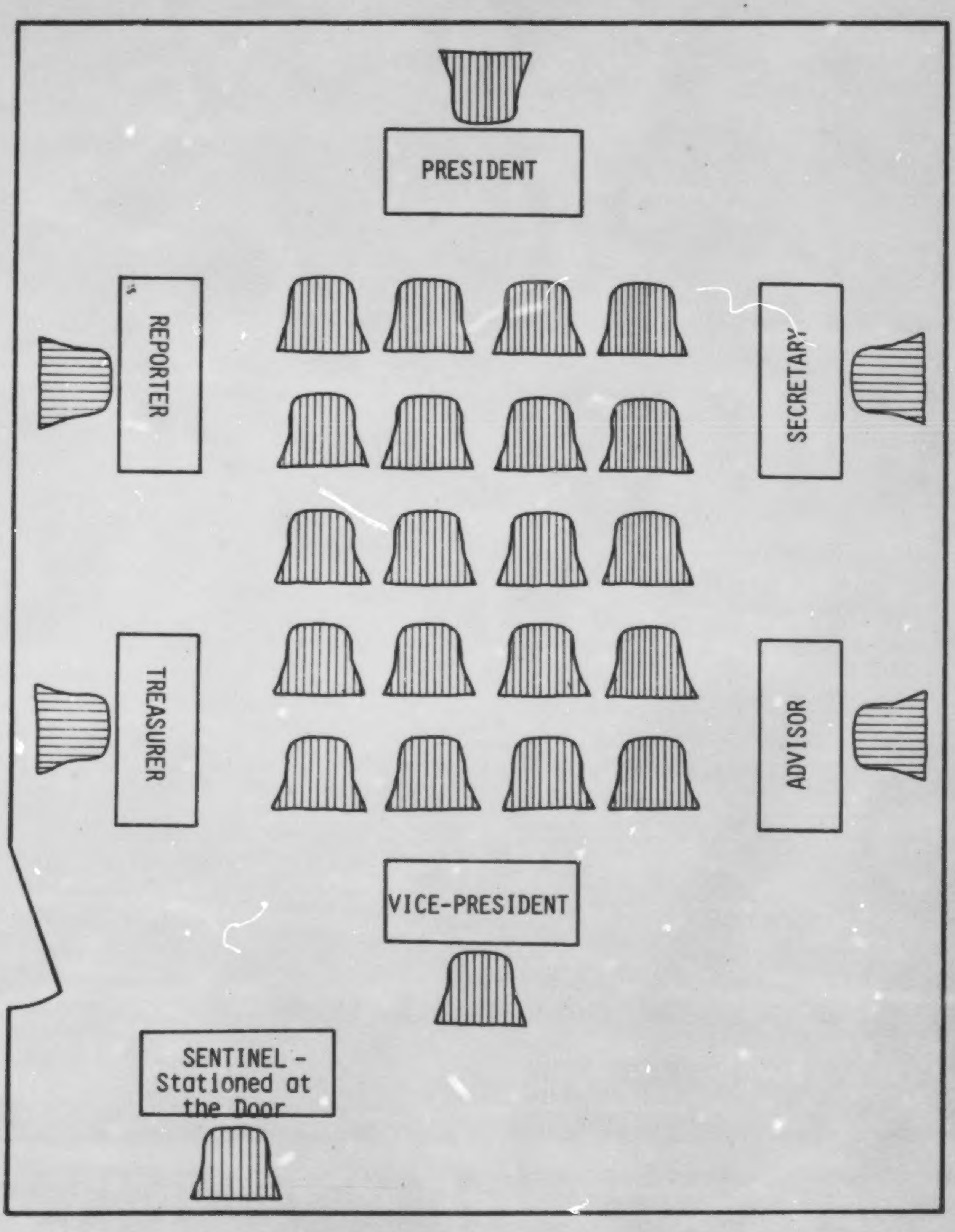
Establish local advisory committee.

Cooperate with other school organizations.

Evaluate the local FFA program.

Transparency I-3-G

MEETING ROOM ARRANGEMENT


PRESIDENT
REPORTER
SECRETARY
TREASURER
ADVISOR
VICE-PRESIDENT
SENTINEL - Stationed at the Door

Transparency I-3-H

ORDER OF BUSINESS

OPENING CEREMONY

MINUTES OF THE PREVIOUS MEETING

OFFICER REPORTS

REPORT ON CHAPTER PROGRAM OF ACTIVITIES

SPECIAL FEATURES

UNFINISHED BUSINESS

COMMITTEE REPORT
STANDING
SPECIAL

NEW BUSINESS

DEGREE AND INSTALLATION CEREMONIES

TRANSPARENCY I-3-I

TAPS OF THE GAVEL

One Tap:	(a)	follows announcement of vote.
	(b)	signals to be seated.
	(c)	follows announcement that a meeting is adjourned.
Two Taps:		calls the chapter meeting to order.
Three Taps:		signals for all members to stand during opening and closing ceremonies.

Transparency I-3-J

MAJOR DIVISIONS OF THE PROGRAM OF ACTIVITIES

SUPERVISED AGRICULTURAL OCCUPATIONAL EXPERIENCE

COOPERATION

COMMUNITY SERVICE

LEADERSHIP

EARNINGS, SAVINGS, AND INVESTMENTS

CONDUCT OF MEETINGS

SCHOLARSHIP

RECREATION

PUBLIC RELATIONS

PARTICIPATION IN STATE AND NATIONAL ACTIVITIES

ALUMNI RELATIONS

TRANSPARENCY I-3-K

INSTRUCTIONAL AREA: Agricultural Leadership

INSTRUCTIONAL UNIT II: Awards, Contests, and Activities

LESSON: Introduction to Local, State, and National Awards, Contests, and Activities

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Describe each type of award and activity, eligibility requirements, and list procedures for entering local, state, and national contests and activities.

2. Specific:

a. Define and give the purposes of the achievement awards program.
b. Name the 22 Proficiency Award areas.
c. Describe the general requirements for a Proficiency Award.
d. Describe and give the purpose of the three types of chapter award programs -- Building Our American Communities (BOAC), Chapter Safety Award, and National Chapter Award.
e. Identify the Star awards that can be earned at the local, state, and national levels.
f. Name and describe the contests that students may enter from the local chapter.
g. Identify the application forms required for the FFA Proficiency awards, Star Awards, and the Chapter Awards.
h. Identify and describe other awards and activities at the various levels.
i.

j.

k.

B. Review of Teaching Materials

1. FFA Advisors' Handbook. National FFA Foundation. Alexandria, Va.: National FFA Supply Service, 1975.

2. Advisors' Teaching Guide on FFA Vocational Education. Published by Future Farmers of American and Massey-Ferguson. Alexandria, Va.: National FFA Supply Service, 1969.

3. Copies of Proficiency Award, Star Award, and Chapter Award applications.

4. FFA Proficiency Award Guidebook. Published by Vocational Instructional Services. College Station, Texas A&M University, 1975.

5. Official FFA Manual. Future Farmers of America. Alexandria, Va.: National FFA Supply Service, 1981.

6. Transparencies

7. National FFA Proficiency Award Handbook

8. Chapter Guide to FFA Activities. National FFA Organization. Alexandria, Va.: 1981.

C. Special Arrangements

1. Display award plaques and medals that class members have won.

2. Invite advanced chapter members and recipients of Star Awards, Proficiency Awards, and Chapter Awards to address the class on what it takes to be successful.

3. Make arrangements for each member to have access to the most recent available Official Manual of the FFA.

4. Arrangements can be made for still pictures of award winning projects and movie film "The Game Plan -- FFA Tackles Community Development" describes the BOAC program. (Available from Venard Film Ltd., P. O. Box 1332, Peoria, IL 61601)

5. Overhead Projector

D. Materials Required

1. Film projector and screen

2. All award and degree applications

3. Colored paper 8½ x 11 (for student activities)

4. Slide-projector -- slide presentation PASS-2 (obtained through the National FFA Supply Service) and slides of previous chapter and member activities.

II. Presentation of Lesson

A. Motivation

1. Discussion of film entitled "The Game Plan -- FFA Tackles Community Development" (Check Special Arrangements).

2. Show slides of chapter members competing for or receiving state or national awards.

3. Invite advanced chapter members to address class (Check Special Arrangements).

4. Show and discuss "PASS-2, More Than Profit."

5. Show slides of chapter and member activities from the previous years.

B. Content Outline

1. Awards

a. FFA Achievement Award Program

1) Purpose of the FFA Achievement Award Program

a) To involve more students of vocational agriculture in the awards system of the FFA.

b) To provide the "average student" and the student with "special needs" more opportunity for recognition.

2) The program provides a system through which the FFA member is recognized for accomplishments in the instructional programs and FFA leadership activities. Members participate against a standard of instruction-related requirements instead of against fellow chapter members. Each student is awarded an Achievement Award Certificate upon satisfactorily completing 80 percent of the skills and tasks that have been contracted for in the areas of career exploration, career skills, leadership, development, and safety practices.

b. Agricultural Proficiency Award Program

1) Purposes of the Proficiency Awards Program

a) Stimulate interest in the instructional program,

b) Stimulate interest in agricultural occupations, and

c) Reward FFA members at the local, state, regional, and national levels for exceptional accomplishments in progressing toward specific occupational objectives.

2) Proficiency Award Areas (Transparency II-I-A) 30

a) Agricultural Electrification

b) Agricultural Mechanics

c) Agricultural Processing

d) Agricultural Sales and/or Service

e) Beef Production

f) Crop Production

g) Dairy Production

h) Diversified Livestock Production

i) Fish and Wildlife Management

j) Floriculture

k) Forest Management

l) Fruit and/or Vegetable Production

m) Home and/or Farmstead Improvement

n) Horse Proficiency

o) Nursery Operations

p) Outdoor Recreation

q) Placement in Agricultural Production

r) Poultry Production

s) Sheep Production

t) Soil and Water Management

u) Swine Production

v) Turf and Landscape Management

3) General Requirements (Transparency II-1-B)

To be eligible for the Proficiency Award, the student must:

a) Be enrolled in a high school vocational agriculture program.

b) Have completed three years of vocational agriculture if out of school for less than one year.

c) Have filled out appropriate application forms and followed the procedures necessary for entering.

d) Have a Supervised Occupational Experience Program (SOEP) in the occupational area for which the award will be granted.

e) Maintain a list of skills learned through classroom, laboratory, and occupational experience.

f) Maintain accurate financial records, inventories of tools and equipment, and materials necessary for the SOEP programs.

c. Star Awards (Transparencies II-1-C -- II-1-E)

The Star Awards are given annually to the most outstanding recipients of:

1) The Green Hand

2) The Chapter

3) The State

4) The American Farmer Degrees

The Star Green Hand is the most outstanding Green Hand in each chapter. The Star Farmers and Star Agribusinessman are selected at the chapter, state, and national levels based on their involvement in production agriculture or agribusiness.

A $100 cash award is provided by the National FFA Foundation for the most outstanding recipients of the State Farmer and the State Agribusinessman degrees in recognition of SOEP's in Production Agriculture and Agribusiness, respectively, and involvement in the FFA.

d. Chapter Awards

1) Building Our American Communities (BOAC) in recognition of outstanding chapter involvement in community-related areas.

2) Chapter Safety Award -- given at State and National Levels to chapters in which members plan, promote, and implement approved practices in the following areas:

a) farm tractor and machinery,
b) home,
c) buildings,
d) shop,
e) fire prevention,
f) traffic and transportation,
g) agriculture chemicals,
h) electrical,
i) livestock, and
j) recreational safety.

3) The National Chapter Award -- in recognition of local FFA chapters which conduct outstanding programs of activities over and above those offered in the classroom or on the farm, and also provide valuable educational experiences for the entire membership.

4) Food for America Program

A combination public relations and leadership development experience for chapter members. Chapter presents a program on the importance of farming and agribusiness to elementary school students, their parents, and other groups. No award is involved in this program.

5) Louisiana Chapter Energy Conservation Program

Designed to encourage chapters to take a more active role in energy conservation, develop and promote community energy conservation programs, and develop active, knowledgeable community leaders who are aware of the need for energy conservation. State winner is sent to the National for consideration in the President's Challenge on Energy Conservation.

6) MFC Livestock Award (Mississippi Feed Cooperative)

Awarded to the chapter compiling the highest number of points in livestock exhibition on the local, state, and regional level.

7) Individual Member Awards--Chapter Level

   a) Leadership -- given to members who have demonstrated outstanding leadership in the chapter.

   b) Scholarship -- given to members who have demonstrated academic excellence in vocational agriculture or other classes.

   c) Outstanding Member -- awarded to members who have demonstrated outstanding achievement in FFA activities related to leadership and scholarship.

8) Individual Member Awards -- State Level

   a) Superintendent of Education Award

Awarded to a Junior or Vo-Ag III student excelling in production and exhibition of livestock in Louisiana. 34

b) Governor of Louisiana Award

Awarded to a Senior or Vo-Ag IV student excelling in production and exhibition of livestock in Louisiana.

2. Contest (Transparency II-1-F)

a. Purpose -- Contests help to develop:

1) technical knowledge,

2) ability to make sound judgments,

3) ability to defend decisions, and

4) ability to be a gracious winner or a good loser.

b. Contests help make classes more meaningful and encourage the development of certain skills.

c. Contests available

1) Livestock Judging--Bulletin No. 1546

a) Placing, grading, and giving oral reasons for market and breeding classes of beef, sheep, and swine.

b) Three-member team eligible for local, area, state, and national competition.

2) Poultry Judging--Bulletin 1545

a) Place and give oral reasons for classes of production hens and pullets, and grade dressed poultry and eggs for interior and exterior quality.

b) Three-member team eligible for local, area, state, and national competition.

3) Dairy Cattle Judging--Bulletin 1542

   a) Placing and giving oral reasons for classes of replacement heifers, production cows, and pedigrees.

   b) Three-member team eligible same as above.

4) Milk Quality and Dairy Products Judging--Bulletin 1543

   a) Milk and cottage cheese samples scored on flavor. Sediment pads scored on degree of sediment. Identify cheese samples and milker parts and score on defects present.

   b) Three-member team eligible same as above.

5) Meats Judging--Bulletin-1544
   Note: Add forms 5 and 6.

   a) Identify wholesale and retail cuts of beef, pork, and lamb. Grade carcasses for yield and quality. Place classes of carcasses and wholesale cuts.

   b) Three-member team eligible same as above.

6) Nursery/Landscape--Bulletin 1548

   Identification of nursery plants, ranking classes of plants, and written tests on nursery/landscape practices.

7) Electrification/Energy Conservation--Bulletin 1549

   a) Drawing and wiring circuits on electric panel boards. Objective test and/or identificaiton of energy conservation materials.

b) Two-member team eligible for local, area, and state competition.

8) Small Engines--Bulletin 1555

a) Assemble, trouble shoot small gasoline engines, and take a written exam on technical information and parts identification.

b) Two-member team eligible for subdistrict, district, area, and state competition.

(1) one trouble shooter and test taker
(2) one assemblyman and test taker

9) Farm Welding--Bulletin 1663

a) Oxyacetylene welding job to be completed and graded. Arc welding job to be completed and graded.

b) Two-member team eligible for local, district, area, and state competition.

10) Pasture and Range--Bulletin 1547

a) Range judging based on classification, use, site condition, class, and management. Pasture judging based on soil factors determining the soil group, selecting plants, other management practices, and plant identification.

b) Three-member team eligible for local, area, state, and international competition.

11) Soils--Bulletin 1505

a) Determining soil class factors and recommending soil treatments, conservation practices, and fertilizer requirements for several sites.

b) Four-member team eligible for local, area, state, and international competition. Top three scores make up the team score.

12) Forestry--Use Louisiana State Study Guide

a) Identification of trees, timber-stand improvement options, and measuring standing timber for sawlog or pulpwood yield per acre.

b) Three-member team eligible for local, area, state, and tri-state competition.

13) Farm Business Management -- "National FFA Contest" Bulletin No. 4

a) Team members will complete a multiple choice/true-false exam and a problem solving exam.

b) One- to three-member team eligible for local and state competition. Three-member team eligible for national competition.

14) Parliamentary Procedure--Bulletin 1540

a) Demonstrate correct use of parliamentary procedures.

b) Six-member team eligible for local, district, area, and state competition.

15) Public Speaking (prepared)--Bulletin 1541

a) Formal prepared speech on agriculture-related topic ranging from five to seven minutes.

b) Individual member eligible for local, district, area, tri-state, regional, and national competition.

16) Extemporaneous Public Speaking--Bulletin 1541

   a) Unprepared speech, "off the cuff," on one of three major subjects--FFA, production agriculture, or agribusiness. A topic is selected at random and time is given to prepare the speech at the contest site.

   b) Individual chapter member eligible for local, district, area, state, tri-state, regional, and national competition.

17) Seed Rice Essay--Held each fall. Open to any FFA member in Louisiana.

   Note: Breed associations, fairs, livestock shows, and others conduct judging and other contests throughout the year.

3. FFA Activities

   a. National FFA Convention--Kansas City Missouri. Early November.

      1) Judging contests

      2) Band

      3) Chorus

      4) Career show

      5) Public speaking contest

      6) Industry and business tours

      7) FFA business sessions

   b. Louisiana State FFA Convention--Baton Rouge. Early June.

      1) Public speaking contests

      2) Convention organist

      3) Courtesy corps

4) Convention delegates, two from each chapter. Appointed to State standing committees.

c. Washington Leadership Conference--Summer. Intensive leadership training activities conducted by present and past FFA officers and noted leaders in the nation. Top officers in chapter eligible to attend.

d. State Leadership Camp--Bunkie, Louisiana. Summer. Chapter officers, potential FFA leaders, and officers are eligible to attend.

e. Funk's G-Hybrid 304 Bushel Challenge Corn Project--Members receive seed corn to plant, care for, and harvest, and attempt to beat the 304 bushel/acre record.

f. State Officers Goodwill Tour--January each year through the state, touring farms, businesses, and FFA Chapters.

g. State Officers Workshop--Granada, Mississippi.

4. Fairs and Livestock Shows

a. Parish Livestock Show--January or February.

This livestock show includes classes of sheep, swine, dairy, and poultry and precedes the district show.

b. District Livestock Show--January or February. Held as an elimination for the LSU Spring Livestock Show. To be eligible for state show entries, animals must place as follows:

1) Beef Breeding, Steers, Sheep Breeding, and Dairy--Purple or Blue Ribbon.

2) Market Hogs and Market Lambs--Purple Ribbon.

3) Poultry--No previous showing necessary.

c. LSU Spring State Livestock Show--Baton Rouge. February. Must qualify at the district level.

d. Southern University Spring Livestock Show--Baton Rouge. March. No prior showing necessary. Beef, sheep, swine, rabbits, and poultry.

e. Louisiana FFA and 4-H Light Horse Show--Baton Rouge. All horses (Appaloosa, Arabians, Paints, and Quarter Horses) must show in halter at the District Show (June or July).

f. National Junior Dairy Show--Memphis, Tennessee. September. Must be selected at a dairy elimination show held in Baton Rouge or Ruston, Louisiana in September. Holsteins, Guernseys, Jerseys, and Ayrshires are the only breeds eligible.

g. Louisville Trip--Top percentage of Market Beef Animals sent. Member must be at least 16 years of age.

h. Parish Fairs--Fall. Livestock and other exhibit opportunities available for members and chapters.

i. Louisiana State Fair--Shreveport. Late October or early November. Beef, sheep, swine, dairy, poultry, horse, and rabbit classes. Weed, seed, sugarcane, rice, cotton, hybrid corn, sweet potatoes, irish potatoes, forestry, insect displays, and exhibitions.

j. LSU Fall Livestock Show--Baton Rouge. November. Dairy, swine, and rabbits.

Note: Contact State Department of Education Agriculture Division, Cooperative Extension Service, and respective fair boards for complete details of each event.

5. Suggested Student Activities

a. Participation in as many activities as is practical for each student.

b. Record all participation in The Basic Record Book, and include date, place, winnings, and skills learned.

c. Class will discuss the topic "Wholesome competition is a fundamental basis for progress." As a follow-up to the above discussion, assign the students to write an essay on the same subject.

d. Each student will be given a Proficiency Award application that corresponds with his/her SOEP. Handout applications for Chapter Awards and Safety Awards. The instructor will review each section of the application with the student.

e. Each student develops a personal folder containing vital personal information on all awards and contests discussed. Each student writes down three awards he seeks to achieve as an FFA member. Additionally, the student writes three activities under each of the three awards that will help him/her to receive those awards. Different colored paper could be used as a coding system for local, state, and national award information, student goals, and student activities. (Transparency II-1-G)

f. Each student will be asked to identify a community activity which may serve as a BOAC project. In addition, identify a problem area in the community requiring promotion of safety.

THE 22 PROFICIENCY AWARD AREAS

AGRICULTURAL ELECTRIFICATION

AGRICULTURAL MECHANICS

AGRICULTURAL PROCESSING

AGRICULTURAL SALES AND/OR SERVICE

BEEF PRODUCTION

CROP PRODUCTION

DAIRY PRODUCTION

DIVERSIFIED LIVESTOCK PRODUCTION

FISH AND WILDLIFE MANAGEMENT

HORTICULTURE

FOREST MANAGEMENT

FRUIT AND/OR VEGETABLE PRODUCTION

HOME AND/OR FARMSTEAD IMPROVEMENT

HORSE PROFICIENCY

NURSERY OPERATION

OUTDOOR RECREATION

PLACEMENT IN AGRICULTURE PRODUCTION

POULTRY PRODUCTION

SHEEP PRODUCTION

SOIL AND WATER MANAGEMENT

SWINE PRODUCTION

TURF AND LANDSCAPE MANAGEMENT

TRANSPARENCY II-1-A

ELIGIBILITY REQUIREMENTS FOR PROFICIENCY AWARD

THE STUDENT MUST:

(1) BE ENROLLED IN A HIGH SCHOOL VOCATIONAL AGRICULTURE PROGRAM.

(2) HAVE COMPLETED 3 YEARS OF VOCATIONAL AGRICULTURE IF OUT OF SCHOOL FOR LESS THAN ONE YEAR.

(3) HAVE COMPLETED THE APPROPRIATE APPLICATION FORMS AND FOLLOWED THE PROCEDURES NECESSARY FOR ENTERING.

(4) HAVE A SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAM (SOEP) IN THE OCCUPATIONAL AREA FOR WHICH THE AWARD WILL BE GRANTED.

(5) MAINTAIN A LIST OF SKILLS LEARNED THROUGH CLASSROOM, LABORATORY, AND OCCUPATIONAL EXPERIENCE.

(6) MAINTAIN ACCURATE FINANCIAL RECORDS AND INVENTORIES OF TOOLS, EQUIPMENT, AND MATERIALS NECESSARY FOR THE SOEP PROGRAMS.

TRANSPARENCY II-1-B

LOCAL FFA STAR AWARDS

Star Greenhand - PRESENTED TO OUTSTANDING FIRST YEAR MEMBER WHO IS MOST ACTIVE IN THE CHAPTER, HAS DEMONSTRATED LEADERSHIP AND A STRONG SOEP.

Star Chapter Farmer - PRESENTED TO THE MEMBER WHO IS THE MOST INVOLVED IN ALL PHASES OF CHAPTER ACTIVITIES.

Star Chapter Agribusiness - SIMILAR TO CHAPTER FARMER EXCEPT THE MEMBER'S SOEP IS IN AGRIBUSINESS.

Transparency II-1-C

STATE FFA STAR AWARDS

Star State Farmer - SELECTED FROM TOP APPLICANTS FOR THE STATE FFA DEGREE. THE RECIPIENT RECEIVES $200 CASH AWARD FOR ACHIEVEMENT IN SOEP IN PRODUCTION AGRICULTURE.

Star State Agribusinessman - SELECTED FROM TOP APPLICANTS FOR STATE FFA DEGREE. THE RECIPIENT RECEIVES $200 CASH AWARD FOR ACHIEVEMENT IN SOEP IN PRODUCTION AGRICULTURE.

Transparency II-1-D

NATIONAL FFA STAR AWARDS

STAR FARMER OF AMERICA - RECOGNITION OF TOP FARMER IN THE NATION. THE NATIONAL FFA FOUNDATION PROVIDES $1,000 AWARD, A PLAQUE, AND A MEDAL.

STAR AGRIBUSINESSMAN OF AMERICA - RECOGNITION OF THE TOP AGRIBUSINESSMAN IN THE NATION. THERE IS A $1,000 AWARD, A PLAQUE, AND A MEDAL PRESENTED.

TRANSPARENCY II-1-E

CONTESTS HELP DEVELOP

1. TECHNICAL KNOWLEDGE
2. ABILITY TO MAKE SOUND JUDGEMENT
3. ABILITY TO DEFEND DECISIONS
4. ABILITY TO BE A GRACIOUS WINNER OR A GOOD LOSER

TRANSPARENCY II-1-F

SAMPLE AWARD GOALS AND ACTIVITIES

PROFICIENCY AWARD IN HORSE PRODUCTION

(1) ATTEND SHOWMANSHIP CLINIC

(2) WORK FOR VETERINARIAN

(3) LEARN TO FORMULATE A RATION

THE STATE FARMER DEGREE

(1) ENTER PUBLIC SPEAKING CONTEST

(2) WORK TOWARD BEING ELECTED A CHAPTER OFFICER

(3) BE A MEMBER OF PARLIAMENTARY TEAM

ENTER LIVESTOCK JUDGING CONTEST

(1) TAKE ANIMAL SCIENCE

(2) READ LIVESTOCK JUDGING BOOKS

(3) ATTEND LIVESTOCK JUDGING CLINICS

TRANSPARENCY II-1-G

INSTRUCTIONAL AREA: Agricultural Leadership

INSTRUCTIONAL UNIT III: Leadership Training

LESSON 1: Public Speaking

I. Preparation for Instruction

A. Student Objectives

1. Terminal: The student will develop, write, and deliver a speech.

2. Specific:

a. List the purposes for making a speech.
b. Write the outline that most speeches follow.
c. List the three "ups" of speech delivery.
d. Describe four ways of rehearsing a speech for self-improvement.
e. List the four criteria for selecting a subject for a speech.
f. List the six elements of good structure in a public speech.
g. Explain the two elements of style in public speech development.
h. Describe the development of body expressions for the enhancement of a speech.
i. List and explain the elements of vocal expression in public speaking.
j. List the types of visual aids that can be used with a speech.
k. State seven rules for planning and presenting a visual aid.
l. Develop one visual aid.
m. Name the personal qualities important to success in public speaking.
n. List five distracting mannerisms.
o. List the two national public speaking contests.
p. Write and deliver a speech.
q.
r.
s.

B. Review of Teaching Material

1. Anderson, Martin, James Murray, and Wesley Lewis. The Speaker and His Audience. New York: Harper and Row, 1964.

2. Purkey, R. D. Handbook on Speech for FFA. Danville, Ill.: Interstate Publishers, 1966.

3. FFA Advisor's Handbook. National FFA Foundation. Alexandria, Va.: National FFA Supply Service, 1975.

4. Official FFA Manual. Future Farmers of America. Alexandria, Va.: National FFA Supply Service, 1981.

5. Advisors Teaching Guide on FFA. National FFA Foundation by FFA and Massey-Ferguson. Alexandria, Va.: National FFA Supply Service, 1969.

6. Instructional Material for Public Speaking (Prepared and Extemporaneous), Bulletin 1541. Baton Rouge: Vocational Agriculture/Agribusiness Section of Vocational Education, Louisiana Dept. of Ed., 1980.

7. National FFA Proceedings with the most recent public speaking contest speeches in written form.

C. Special Arrangements

1. FFA awards for public speaking will be displayed.

2. Class members will be given a speech evaluation sheet and an FFA Public Speaking score sheet to evaluate their peers in the contest (see student activity).

3. The chapter public speaking winner will be invited to the class to deliver his winning speech to the class and to explain the preparation involved.

4. Projector and screen will be needed for film show. Lecture will also be desirable for speech competition.

5. Copies of the Rules and Regulations for FFA public speaking contest will be made available to each student.

II. Presentation of Lesson
   A. Motivation

      1. Class discussion on how good speaking ability affects one's success in getting good jobs, becoming a leader, etc.

      2. Show slides with cassette entitled "Sights and Sounds of the National FFA" highlight speakers and events during the most recent National FFA Convention; available from FFA Supply Service.

      3. Play cassette of the most recent national public speaking contest (National FFA Supply Service).

      4. Allow the previous chapter public speaker to give a speech and explain the benefits of being able to speak confidently to a group of people.

      5. Discuss examples of great men who have succeeded because of the ability to express themselves effectively.

B. Content Outline

1. Purpose of Making a Speech (Transparency III-1-A)

   a. To inform -- This is a presentation of facts to give the listeners a definite mental picture of what you are talking about so they will understand the subject matter.

   b. To entertain -- Enjoyment or pleasure is the keynote of this type of speaking. A message may be included but the speech will reflect a happy mood or one of relaxation.

   c. To persuade -- The speaker tries to convince the listener to believe as he does. By using reason, supportive illustrations and facts, and sincere belief in what he/she is saying, the speaker may persuade the audience.

   d. To gain action -- Using all previous types of speeches, the speaker attempts to motivate or gain some actual "doing" of what he suggests. The speaker must consider interests of the audience and suggest lines of action beneficial to them.

2. Speech Outline (Transparency III-1-B)

   a. Introduction -- The speaker must get the attention of the members of his audience and acquaint them with his subject so they will know his purpose and what he is talking about.

      Five types of introductions are:

      1) Using personal references,
      2) Humor,
      3) Reference to surroundings,
      4) Reference to idea of speech, and
      5) Emotional or dramatic.

   b. Discussion -- This is the "body" of the speech; while preparing it the speaker must always keep his mind on the specific goal he seeks to achieve with the speech. Write the specific idea in sentence form and keep this in front of you. This will help eliminate any ideas from entering the speech that do not have relationship to the purpose or idea. This maintains unity and coherence throughout the speech.

c. Conclusion -- The conclusion allows the speaker to end the speech smoothly without a sudden stop or break in thought. This is a good time to make a summation of main points or to make a final plea or attempt at persuasion.

d. Mechanics of outlining -- An outline aids the speaker in organizing, memorizing main ideas, and keeping the principle of simplicity alive.

3. The three "ups" of speech delivery

    a. Stand up
    b. Speak up
    c. Shut up

4. Rehearsal

    a. Try speech on others.

    b. Use a mirror for practice -- this aid can help the student get an idea of how he looks to others. Since people may respond to and judge speakers by what they see, the student can eliminate bad habits and mannerisms before standing in front of an audience.

    c. Practice with note cards -- Note cards can be a good aid if absolutely necessary for the speaker. A few note cards written on one side only can assist the student, at a glance, to remember a key point or phrase. Printing the manuscript on note cards to be read should be avoided. Only key words or phrases should be included to help the speaker, at a time of momentary lapse of memory, regain the thought of the speech.

    d. Using tape recorder -- A playback of a recording of a rehearsal session can assist the student in making corrections in vocal expression after the speech is ready to present.

5. Evaluation of a good speech

   a. Content (Transparency III-1-C)

      1) Choice of subject -- Select it early

         a) In what is the speaker interested? It is difficult to fully prepare and present a speech to an audience expressing real feelings and emotion if the speaker is not interested in his subject. An audience can quickly detect artificiality.

         b) What interests the audience?

         c) What is the occasion?

         d) How much time is given the speaker to prepare and give the speech?

         e) Is the topic of timely interest?

      2) Adequacy of material -- The speaker needs to assure himself that the material used to prepare the speech fully covers whatever topic selected. To help secure information, one may use such sources as magazines, pamphlets, books (library), bulletins, newspapers, and interviews with individuals.

      3) Adaptation of material -- In public speaking, a word becomes an initiator of a whole train of thought. However, if an audience is unfamiliar with a term or what it represents, a longer explanation must be used. Therefore, the speaker should explain a subject by

using facts and ideas familiar to the audience. The speaker must ask himself the question, "How much does the audience already know about the subject I am about to present?" The speaker can then proceed to adapt the material not only to the needs of the audience but also to their understanding of the subject matter.

4) Concreteness -- The content of the speech must be constructed with simplicity and present solid, meaningful material in understandable terms. If not, the purpose of the speech may not be achieved. Communication is possible because both the audience and the speaker have attached similar meanings to words. To create desired meanings in the minds of the audience, the speaker must think in terms of specific reality and express himself in specific, vividly concrete language. This can be promoted by the use of imagery that stimulates the sensory perceptions through which meanings have been learned.

b. Structure (Transparency III-1-D)

1) Introduction

2) Clarity of purpose -- The purpose must be clear to the speaker to eliminate meaningless deviation from this intended purpose.

3) Unity

4) Emphasis -- Main points in the content should be obvious to both speaker and listener because of effective emphasis made on these important elements. The speaker must call attention to them in the mind of the listener. The emphasis

varies with the thought or meaning behind the speaker's remarks.

5) Coherence -- All parts of the speech must fit together and thought flow should be smooth and sequential throughout the speech.

6) Conclusion

c. Style (Transparency III-1-E)

1) Clarity -- Coherence of ideas is important to a reasonable, logical, or natural relationship of ideas. Clear and logical transition from one idea to another and appropriate grammatical construction and language usage facilitates continuity and clarity of the speech. In addition, emphasis is essential to stress the important ideas. Types and length of sentences, repetition of key words or phrases, and language usage that creates imagery affect the style of an individual speaker. The third element of clarity is directness. This means to avoid words unclear to the listener. Specific words and expressions pinpoint meanings better than vague, wordy sentences. Accuracy in meaning is what the speaker seeks to convey.

2) Impressive -- Impressiveness means those qualities of language that intensify the effect upon the mind or emotions of the listener. Ways of achieving impressiveness in oral style are:

a) Imagery -- Visual and auditory

b) Figures of speech -- Simile; metaphor; analogy; personification; contrasts between two objects, concepts, or persons, and climax.

d. Body Expression (Transparency III-1-F) 50

1) General Posture -- Assuming a good posture will largely determine the success of the speech. Foot position is important to maintain good balance and good foundation for the body and body muscles to act smoothly and coordinate with your speaking. Usually, one foot will fall opposite the instep of the other with the feet being 3 to 4 inches apart, toes turning slightly outward. Arms and hands need to be in a natural, comfortable position either in front or at the side of the speaker, ready to be used for hand gestures when needed. Finally, the head and eye position is extremely important. Eye contact must be maintained with the entire audience. If not, the listener may lose interest, continuity, and meaning intended in the speech. Therefore, the head should be up and facing the audience so movement of the eyes throughout the entire audience can be maintained.

2) General Body Movements -- Body movement gets the attention of the audience because movement attracts. In addition, it serves as punctuation for a speech and aids in increasing emphasis where needed. Also, thoughts can be collected by slight body movement. Any body movement, however, should be coordinated with what the speaker is saying. The movement should not draw attention to itself but should aid in giving emphasis and attention to the speech and not the speaker.

3) Gestures -- A gesture is any action of the hands, arms, shoulders, head, torso, or face that helps convey an idea.

    a) All gestures should be made with the entire body.

b) A gesture should show a meaning behind it, not just a mechanical motion for gesture's sake alone.

c) Each gesture should be correctly timed. This is coordination between what is said and what your body is doing.

d) Gestures must come from within a person; there must be a feeling that a gesture is needed to help express an idea. There are two kinds of gestures: 1) gestures of of description, and 2) gestures of emphasis.

4) Eye Contact -- The speaker must maintain a "personal" eye-to-eye contact with members of the audience. This tends to make the audience feel of a real association with the speaker and that he is concerned and sincere about what he is saying.

5) Facial Expression -- Facial expression and other gestures must coordinate with each other. For example, a strong, emphatic gesture would be weakened by an apathetic or weak facial expression. Facial expressions should reflect true feelings and reactions indicating the speaker is active, vivacious, and alert. Coordinating the idea expressed with facial expression can be enhanced by mental imagery. When mental imagery is clear, precise expression of thoughts is facilitated.

e. Vocal Expression (Transparency III-1-G)

1) Projection -- A speaker has the responsibility of speaking with enough volume and force to be heard by the entire audience. If not, a weak, ineffective tone and words which are uttered, but not heard, can be the result.

2) Pitch -- A raising and lowering of the voice is employed to bring out meanings in sentences. It will

vary as purposeful changes are made to suit the mood of what is said. Change in pitch should become flexible, spontaneous, and responsive to changes in thought process and in messages to the listeners. Avoid a monotone.

3) Flexibility -- To overcome the expressionless monotone that characterizes many speakers, the speaker needs an adequate means of expressing himself through variations in pitch. Flexibility allows him to flow smoothly from high pitch to low pitch depending on the importance of ideas in a statement or phrase, thereby conveying a meaning that is clear and emphatic. The three important variables in flexibility are pitch, force (loudness), and rate (speed).

4) Quality -- Quality refers to the tone of voice shown to the audience. Some are classified as harsh, weak, nasal, flat, unpleasant, rich, full, robust, and empty. Through a playback by tape recorder, a rich and clear tone should be developed while less desirable tones are eliminated.

5) Rate -- Rate pertains to the rapidity with which sounds and words are spoken. Varying speeds in speech can be used depending on the effect the speaker intends to project at any particular spot in the presentation. The point to remember is that the listener has only one chance to get the thought. If he fails to do so, he is lost.

   Three general principles that apply to rate are:

   a) Sentiments that are important or weighty usually take a slow rate of speaking;
   b) Sentiments that are expressive of light, exciting thoughts generally take a rapid rate of speaking; and

c) Sentiments expressing unemotional, commonplace thoughts require a moderate speaking rate.

Pauses are additionally important because they give transition from one thought to another and can be used as a medium for emphasis.

6) Fluency -- Fluency is the smoothness in the flow of words. Faulty breathing, inadequate preparation, or poor speech habits cause frequent hesitations and pauses in which the speaker attempts to find the right word. This type of delivery distracts the listeners because they cannot follow the speaker's ideas. This hesitancy usually indicates an indecisive and muddled mind. Three ways to increase a smooth utterance in delivery is to be familiar with the subject matter, use precise articulation, and develop the practice of good phrasing.

7) Pronunciation -- Pronunciation deals with the process of producing words and phrases but is primarily concerned with syllabic emphasis prescribed by standard usage. Mistakes in pronunciation may irritate or even offend an audience. Therefore, the speaker must be sensitive to regional or cultural influences on pronunciation of some words while a simple dictionary definition may be universal in acceptance. Some common pronunciation errors are omissions of necessary sounds, additions of unnecessary vowel sounds, inversion of two sounds, substitution of vowel sounds, and misplaced accents. A good way to improve pronunciation is to consult a dictionary.

8) Articulation -- Articulation is the process of forming, joining, and separating basic sounds to produce

vowels and consonants which constitute a pattern of oral speech. This articulation must be precise, clear, and distinct. This prevents mumbling, slurring, and improperly produced word sounds.

Articulation is accomplished by the moveable components of the oral cavity: the lips, jaw, tongue, and soft palate. Proper articulation depends on the vigor and accuracy with which these components produce various sounds. Poor articulation may cause the audience to view the speaker as lazy, careless, and uninterested in his speech.

f. Visual Aids -- Integrating visual materials into a speech facilitates learning that is quicker, more deeply impressed on the mind, and remembered better. Appeal to the eye and ear adds interest, clarity, and logical proof to a speech. The speaker should avoid, however, using visual aids as a crutch. A visual aid is simply an additional tool to help clarify points to the audience.

1) Types of visual aids are:

a) Maps,
b) Charts and diagrams,
c) Graphs,
d) Posters,
e) Specimens,
f) Models,
g) Work-ups, and
h) Cutaways.

(It should be noted that visual aids are not admissable in the FFA Public Speaking Contest.)

2) Plan Use of Visuals in Advance

a) All visual aids except drawings made while speaking should be made in advance.

b) If simple diagrams are to be placed on a blackboard, practice making them before the time of your speech.

c) Know how much time you need for showing each aid and be sure to allow for this time in the overall time schedule for the speech.

d) Know exactly the place in the speech at which each aid will be shown.

e) If an assistant is needed to help you show an aid properly, arrange for this help before starting to speak.

f) If several aids are to be shown, arrange them in proper sequence for showing. Do not show more than one at a time, unless they are aids which you have already talked about.

g) If you intend to provide hand-out materials, be sure their distribution does not interfere with your presentation.

h) Be sure that the various auxiliary aids you will need such as pointer, chalk, eraser, masking tape, or newsprint are on the platform before you start to speak.

i) Plan the specific place on the platform where you will stand when showing the aid.

j) Plan the manner in which you will lay aside or cover the aids after they have been used.

k) Plan the manner in which you will collect any aids distributed to the audience after the speech.

l) If a visual aid shows only part of a process or object, plan to mention this fact prior to showing the aid.

m) If there are a number of items on the visual aid to which you will refer, plan in advance some comment which will direct the attention of the audience to the first item to be talked about.

3. Make Effective Presentation of Visual Aids

a) Letters and numbers must be large enough to be seen from all parts of the room.

b) The viewing angle for an aid should be such that all members of the audience can see it with ease.

c) All labels and written material should be short and simple.

d) Visual aids should not be shown in the glare of the light.

e) Keep visual aids close to the speaker's stand. If possible, avoid walking a considerable distance to and from a blackboard.

f) When calling attention to a visual aid, show it.

g) When placing drawings on a blackboard during a speech, do not put too much on the board at any one time.

h) Never talk facing the blackboard for an excessive amount of time. Maintain as much direct contact with the audience as possible while putting a drawing on the board.

i) In using maps or graphic aids always use a pointer to indicate details referred to.

j) Never reach across your body to point to items. Hold the pointer in your left hand if that is closer to the visual aid.

k) Always give the audience sufficient time in which to see the content of the aid.

l) After showing a visual aid, summarize the content covered to emphasize the important points.

m) All visual aids should be put away, covered, or erased after showing.

n) Never forget that you are the chief instrument of communication by allowing the exhibit to become the center of interest.

g. Personal Qualities (Transparency III-1-H)

1) Enthusiasm -- Listeners want a speaker to be spirited and eager to share ideas with them. Vitality, optimism, and freshness give the audience a positive attitude as well as help the speaker reflect this part of himself to the audience. A dynamic speaker must be a vital, alert individual with a consuming interest in the subject, a sympathetic awareness of the audience, and a keen eagerness to communicate the speech to the listener.

2) Friendliness -- Everyone likes a genial speaker. A fault-finding, irritable person cannot be successful in getting people to accept a belief or join whole-heartedly in any venture. Friendliness is revealed best in manner and not by words. In addition, a genuine,

kindly smile can assure the audience of the speaker's warmth of personal interest and a sense of trust.

3) Sincerity and Honesty -- Most audiences consider sincerity to be the most important characteristic of a speaker. This sincere approach allows the speaker to acquire a sharper edge of impressiveness. The honest, sincere speaker only advocates those causes in which he can deeply believe. Sincerity provides a strong force behind all the speaker's efforts in gathering material, delivery, and effect on the audience.

4) Intellectual Preparation -- The effective speaker must be an intelligent, knowledgeable person who is competent in the subject area of his speech. By developing interests in and knowledge about a wide variety of subject matter areas, the speaker can tap a reservoir of information helpful in becoming a well-rounded and mature individual. Some hints to self-improvement in this area are:

   a) Become an avid, selective reader;

   b) Become a skilled and constant observer by being sensitive to the flow of life around us;

   c) Make time for personal reflection on assets and liabilities along with values and concepts that have been acquired; and

   d) Keep significant materials by maintaining a constantly expanding speaker's file.

5) Self-confidence -- The most common reaction to initial public speaking is the apprehension called "stage fright." The student may exhibit trembling hands, perspiring palms,

a dry mouth, a shaky voice, breathlessness, and temporary loss of memory as a result of this fear. A variety of reasons such as fear of possible audience disapproval, a sense of being inadequate to the task, and uneasiness about being the focus of attention can cause this undesirable malady for a speaker. Stage fright, however, can be lessened through effective treatment promoting self-confidence.

a) Select a subject you strongly want to discuss with the audience.

b) Prepare thoroughly.

c) Prepare psychologically -- Positive thinking makes the speaker appear confident and knowledgeable about the subject matter. In addition, the speaker must realize he/she is not the only one having this problem.

d) Be so interested in creating the desired response that you forget yourself.

h. Mannerisms -- Unnecessary body movements can detract from the effect of a speech and lessen its impact on the listener. In fact, thoughtless, offensive body stance or movement may turn an audience against a speaker. Some common distracting mannerisms are: (Transparency III-1-I - III-1-L)

1) Fumbling with a pencil,

2) Pulling ear or nose,

3) Putting thumbs under belt,

4) Standing with hands on hips,

5) Looking out the window or at the ceiling,

6) Folding and unfolding arms,

        7) Putting foot on a table or chair,

        8) Leaning excessively on the lectern or reading stand,

        9) Jingling money or keys, and

        10) Rolling or playing with notes.

6. FFA Public Speaking Contests

    a. Prepared public speaking contest

        1) This contest is open only to students regularly enrolled in vocational agriculture during the current calendar year.

        2) Each contestant's manuscript will be the result of the student's own efforts.

        3) A contestant will wear the official FFA dress.

        4) Contestants may choose any current agricultural topic.

        5) Each speech will be 6 to 8 minutes in duration.

        6) Contestants will draw for placings on the program.

        7) Three judges will decide the winners.

        8) The contestants will turn in typed copies of their speech.

        9) Each judge can ask the speaker questions during a 5-minute question period after the speech.

    b. Extemporaneous public speaking contest

        1) The contest is open only to students regularly enrolled in vocational agriculture during the current calendar year.

2) One of three announced subjects will be selected by the contestants 30 minutes prior to the contest. A room will be available for preparation.

3) Each speech will be 4 to 6 minutes in length.

4) The judges will ask questions of the speaker during a 5-minute question period after the speech.

C. Suggested Student Activities

1. Students will be given the following assignments for in-class presentations -- maximum 3 minutes.

    a. Introduce a classmate.

    b. Conduct a local public speaking contest in which all class members must participate.

2. Students will select one of the following areas for presentation to the class -- maximum 6 minutes.

    a. A personal experience speech

    b. A speech to persuade others to join FFA

    c. A short demonstration

    d. A speech to nominate a candidate for FFA office

    e. A speech on any phase of FFA to be presented to local community clubs and organizations

3. Class homework assignment will be to list at least 10 occasions, ceremonies or situations in which speech-making is appropriate or required.

4. Each student will develop a speech outline on a subject of his choice. Following this, the student will develop a set of note cards for use in delivery of the speech.

5. The student will develop two visual aids for the prepared speech as outlined previously. 62

6. The student will list the rules for the extemporaneous and prepared public speaking contests.

PURPOSES OF A SPEECH

TO INFORM - PRESENTATION OF FACTS

TO ENTERTAIN - ENJOYMENT OR PLEASURE

TO PERSUADE - CONVINCE THE LISTENER

TO GAIN ACTION - MOTIVATE ACTION BY LISTENER

TRANSPARENCY III-1-A

TRANSPARENCY OF OUTLINE

Title

(Purpose - a statement)

I. Introduction - 10%
    A.
    B.
        1.
        2.
    C.

II. Discussion - 80-85%
    A.
        1.
        2.
            a.
            b.
    B.
        1.
            a.
            b.
            c.
        2.
            a.
            b.
        3.
    C.
        1.
        2.
        3.
            a.
            b.
    D.
        1.
        2.

III. Conclusion - 5%
    A.
        1.
        2.
        3.
        4.
    B.

Transparency III-1-B

CONTENT

CHOICE OF SUBJECT - SELECT IT EARLY

- SPEAKER INTEREST
- AUDIENCE INTEREST
- OCCASION
- TIME TO PREPARE AND DELIVER SPEECH
- SELECT TOPIC OF TIMELY INTEREST

ADEQUACY OF MATERIAL - COVER THE SUBJECT

ADAPTATION OF MATERIAL - MEET THE NEEDS OF THE AUDIENCE

CONCRETENESS - MEANINGFUL MATERIAL IN UNDERSTANDABLE TERMS

TRANSPARENCY III-1-C

STRUCTURE

INTRODUCTION

CLARITY OF PURPOSE

UNITY

EMPHASIS

COHERENCE

CONCLUSION

TRANSPARENCY III-1-D

STYLE

CLARITY -

- NATURAL, LOGICAL RELATIONSHIP OF IDEAS
- TYPES AND LENGTHS OF SENTENCES
- REPETITION OF KEY WORDS
- LANGUAGE THAT CREATES IMAGERY
- DIRECTNESS - SPECIFIC WORDS AND PHRASES

IMPRESSIVENESS -

- INTENSIFY THE EFFECT ON THE LISTENER'S MIND
- IMAGERY
- FIGURES OF SPEECH

TRANSPARENCY III-1-E

BODY EXPRESSION

- GENERAL POSTURE
- GENERAL BODY MOVEMENTS
- GESTURES
  - CONVEYS MEANING
  - CORRECTLY TIMED
- EYE CONTACT
- FACIAL EXPRESSION

VOCAL EXPRESSION

PROJECTION - SPEAK WITH ENOUGH VOLUME

PITCH - RAISING AND LOWERING OF THE VOICE SOUNDS

FLEXIBILITY - FLOW FROM VARIATIONS OF PITCH

QUALITY - VOICE TONE

RATE - SPEED WITH WHICH SOUNDS AND WORDS ARE SPOKEN

FLUENCY - SMOOTHNESS IN THE FLOW OF WORDS

PRONUNCIATION - PROCESS OF SYLLABIC EMPHASIS TO PRODUCE WORDS AND PHRASES

ARTICULATION - FORMATION OF BASIC SOUNDS TO PRODUCE VOWELS AND CONSONANTS WHEN SPEAKING

TRANSPARENCY III-1-G

PERSONAL QUALITIES

ENTHUSIASM

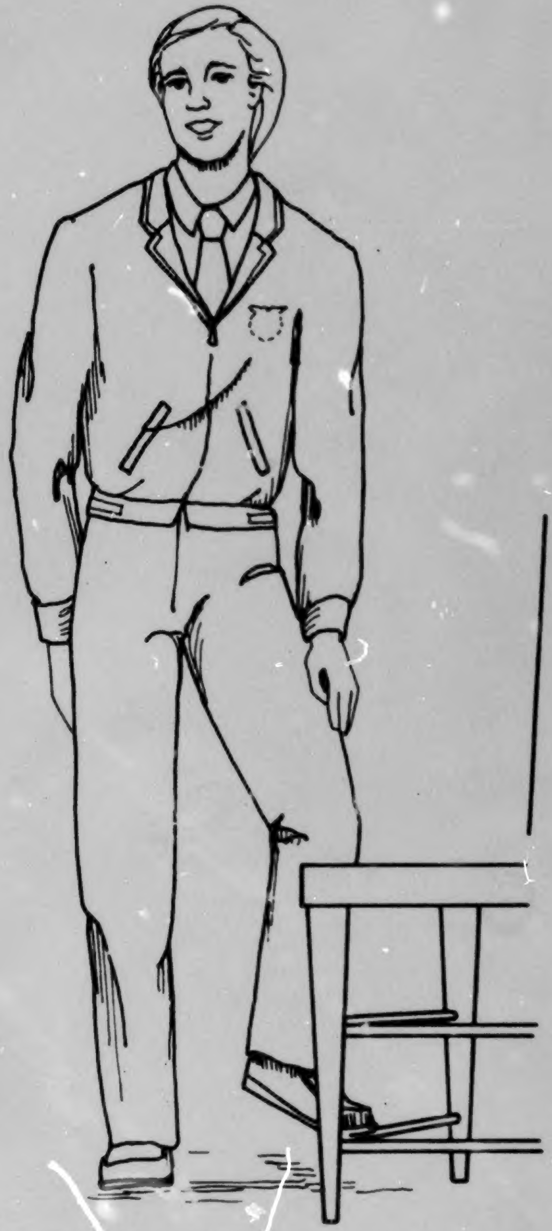
FRIENDLINESS

SINCERITY AND HONESTY

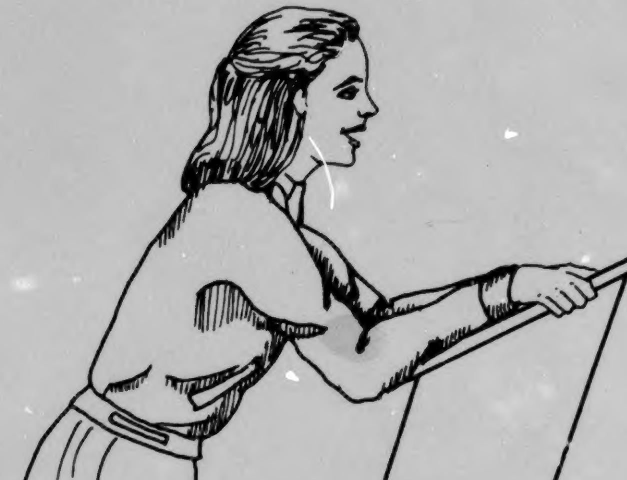
INTELLECTUAL PREPARATION
  - READ
  - OBSERVE LIFE
  - PERSONAL REFLECTION
  - MAINTAIN SPEAKER'S FILE

SELF-CONFIDENCE

DISTRACTING MANNERISMS



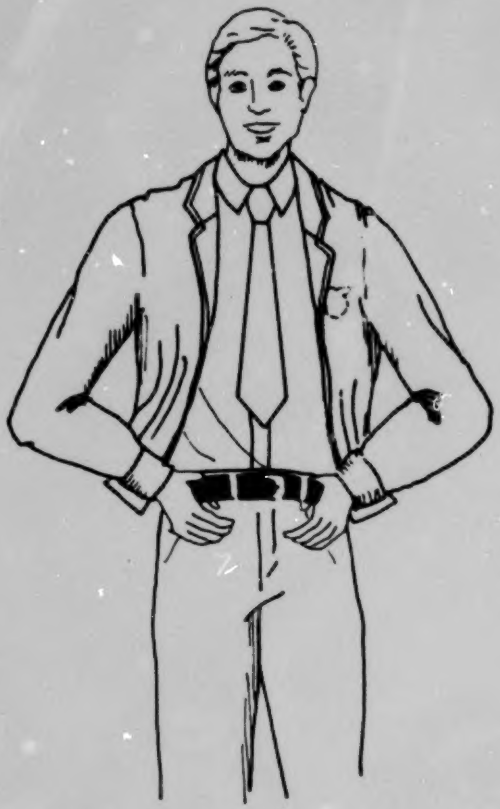
PLACING FOOT ON A CHAIR OR TABLE



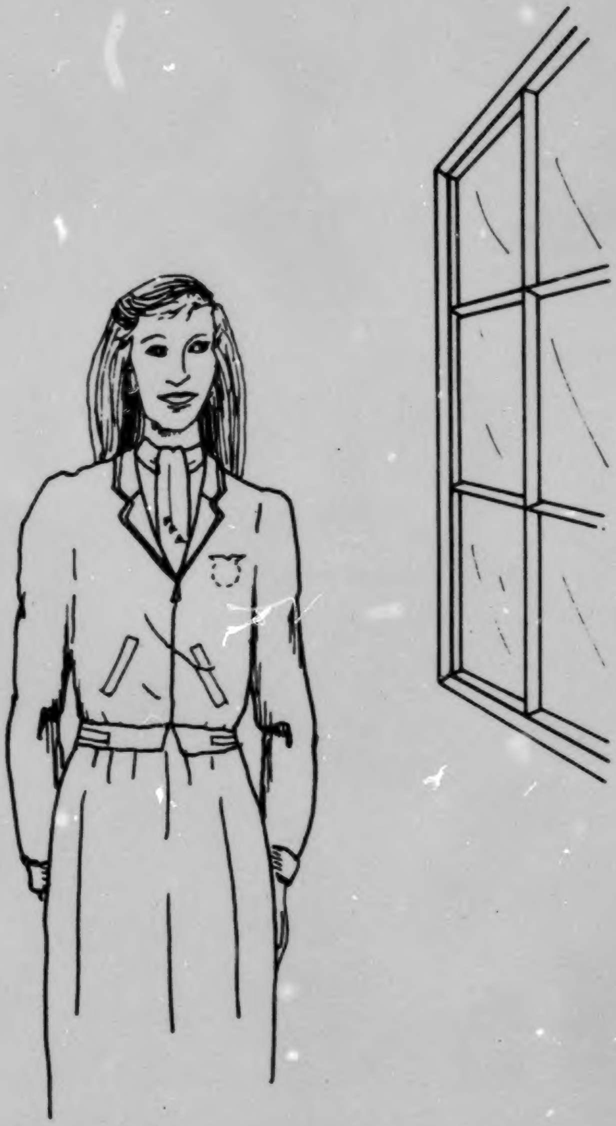
LEANING HEAVILY ON A LECTERN OR READING STAND

TRANSPARENCY III-1-1

DISTRACTING MANNERISMS



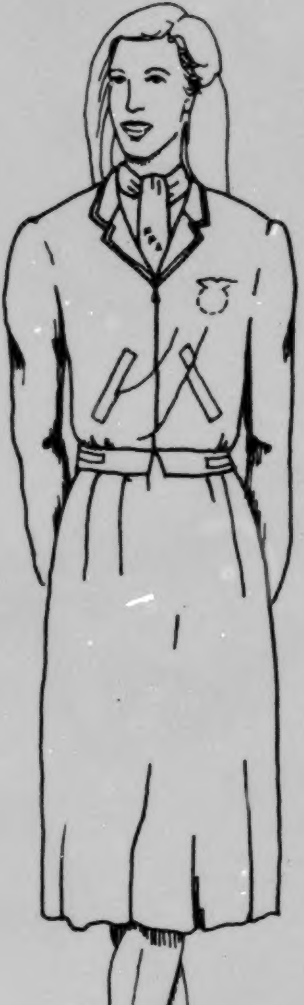
PUTTING THUMBS UNDER BELT



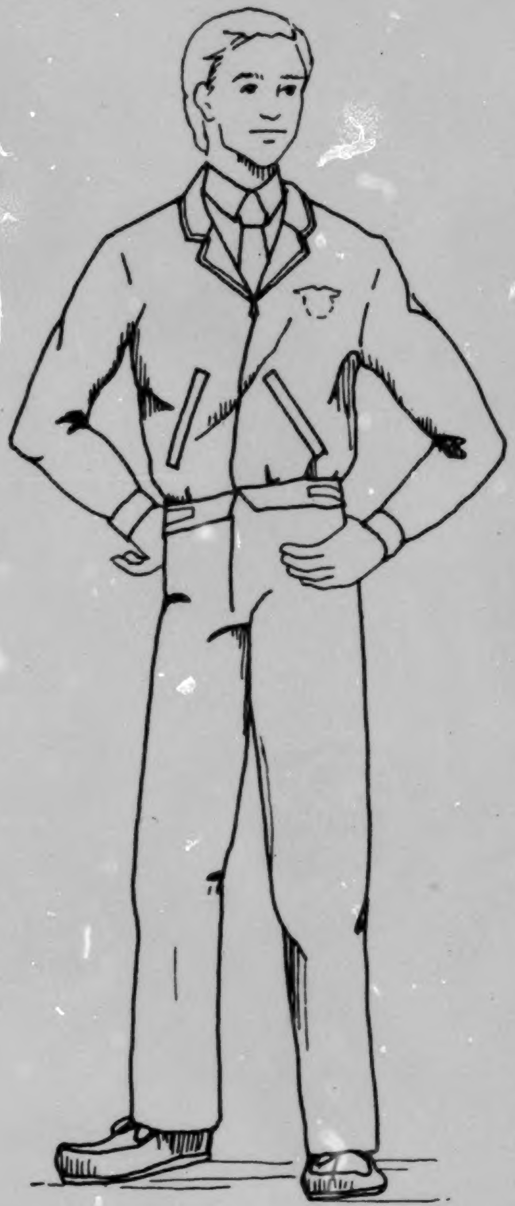
LOOKING AT THE CEILING OR OUT THE WINDOW

TRANSPARENCY III-1-J

DISTRACTING MANNERISMS

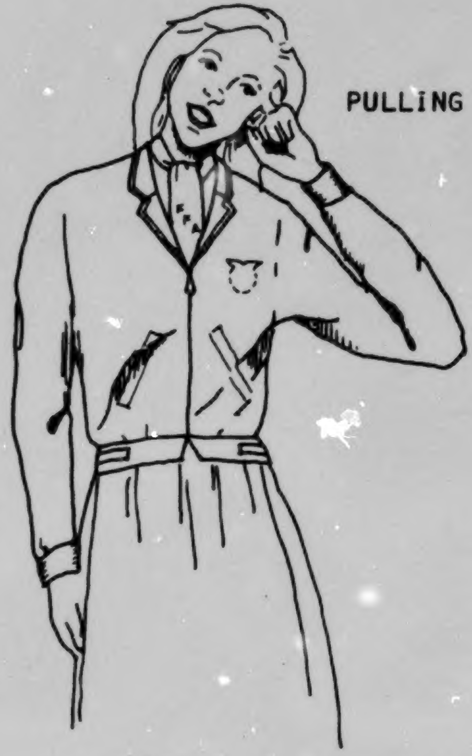


STANDING CROSS-LEGGED

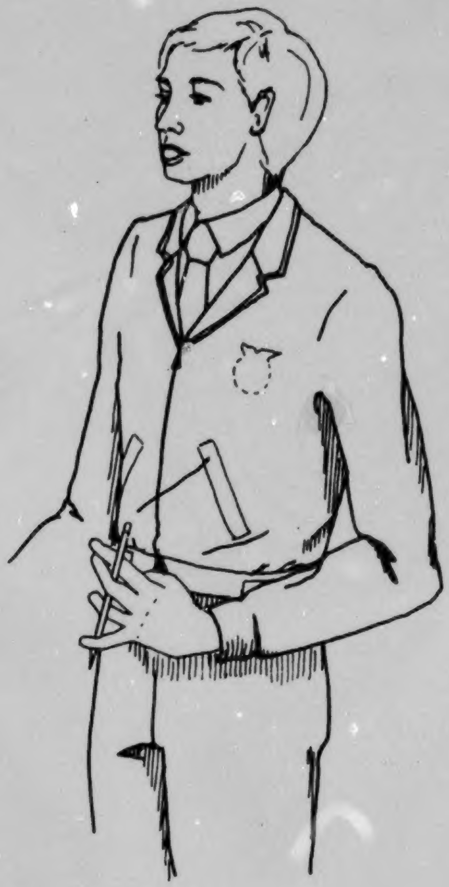


STANDING WITH HANDS ON HIPS

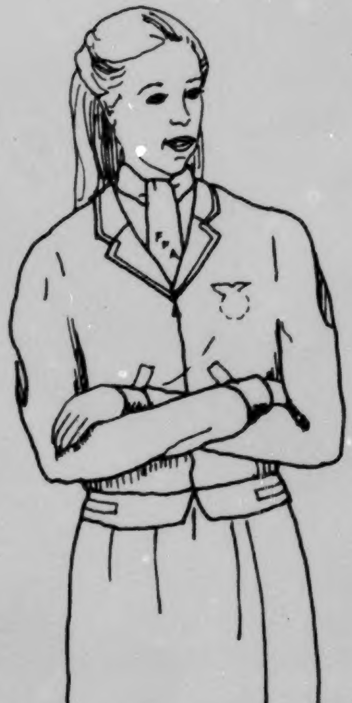
DISTRACTING MANNERISMS



PULLING AN EAR OR A NOSE



FUMBLING WITH A PENCIL



FOLDING AND UNFOLDING ARMS

INSTRUCTIONAL AREA: Agricultural Leadership

INSTRUCTIONAL UNIT III: Leadership Training

LESSON 2: Parliamentary Law

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Conduct a chapter meeting using proper parliamentary procedure.

2. Specific:

   a. State three benefits of learning parliamentary procedure.
   b. List and explain four voting procedures.
   c. List and explain the four types of votes.
   d. State five characteristics of an ideal presiding officer.
   e. Demonstrate each of the 12 abilities from Stewart's booklet.
   f.
   g.
   h.

B. Review of Teaching Materials

1. Gray, Jarrell D. Parliamentary Guide for FFA. Wolfe City, Tx.: Henington Publishing Co., 1964.

2. Stewart, Wilbur F. Helps in Mastering Parliamentary Procedure. Zanesville, Oh.: G. A. Biery, 1970.

3. Robert, Henry M. Robert's Rules of Order. New York: William Morrow and Company, 1971.

4. FFA Student Handbook, National FFA Foundation. Alexandria, Va.: National FFA Supply Service, 1977.

5. Official FFA Manual. Future Farmers of America. Alexandria, Va.: National FFA Supply Service, 1981.

C. Special Arrangements

1. Display awards won by previous parliamentary procedure teams.

2. Parliamentary team demonstration

D. Materials Required

1. 3" x 5" index cards

2. Gavel and FFA paraphernalia

II. Presentation of Lesson

A. Motivation

1. Show and display awards won by previous parliamentary procedure teams.

2. Arrange for a local attorney or other community leader to give lecture on how parliamentary procedure can be used in different organizations.

3. The parliamentary team will demonstrate use of parliamentary procedure for the class.

4. Make a "thermometer" chart and indicate how much progress the students in class or on the team are making toward the goal of proficiency in parliamentary procedure.

B. Content Outline

1. Benefits of mastering parliamentary law--

    a. Build confidence in conducting meetings,

    b. Develop leadership abilities in dealing with other people in group situations,

    c. Learn and exercise the fundamental democratic principles, and

    d. Develop skills that are needed to work in harmony with groups of people to accomplish a task.

2. Fundamental Parliamentary Practices

    a. Presenting a Motion

        1) Rise and address the president. The floor must be yielded before another member may request recognition by addressing the president. It would be out of order to be standing when another member has the floor, except to interrupt a speaker when permitted under parliamentary rules.

        2) After a member has properly addressed the president, the president may recognize the member by calling him by name or by office held.

        3) Making the motion -- The only way to offer a motion is to say, "I move that ..." Brief remarks preceding the motion may help clarify the motion and explain why it is being offered.

        4) Seconding the motion -- A second is made without obtaining recognition. If a motion requires a second but does not receive one, it dies for lack of a second. If a second is not given immediately, the president may ask if there is a second. The member may state, "Mr. President, I second the motion," or simply, "second."

5) Statement of the question -- The statement of the question is put by the president, stating the motion made and seconded. If the motion is debatable, this may also be stated. This statement puts the motion before the chapter for reconsideration. It is not before the chapter until it is stated by the president.

6) Debate -- Discussion on debatable questions is limited to the last motion stated by the president. The person making the motion cannot offer discussion against the motion but may vote against it.

7) Voting Procedures

    a) Rising -- This may be done by a show of hands or by standing.
    b) Voice
    c) Roll call
    d) General consent
    e) Secret ballot

8) Types of Votes

    a) Majority -- more than half the votes cast
    b) Plurality -- a candidate has received more votes than any other candidate.
    c) Two-thirds -- a person receiving 2/3 of the votes cast has a 2/3 vote.
    d) General consent -- all members must consent to this vote. If one member objects, a vote appropriate to the motion must be taken.

9) Characteristics of the Presiding Officer

    a) Manifests poise
    b) Possesses a clear, strong voice
    c) Reasonably deliberate
    d) Manifests mastery of accepted rules of parliamentary procedure

e) Possesses good judgment
f) Must be fair
g) Must be tactful

3. Abilities to be performed

a. Ability 1 -- To receive and dispose of a motion of business. The purpose is to bring an item of business before the chapter for consideration.

1) Second required

2) Debatable

3) Amendable

4) Majority vote required

5) Can be reconsidered

6) The proper terminology used for making the motion is, "I move that ..."

b. Ability 2 -- To receive and dispose of a motion and its amendment. The purpose of this motion is to change the intent or purpose of the original motion. This is done by striking out words, adding words, striking out and adding words, or adding a phrase.

1) Second required

2) Debatable

3) Amendable

4) Majority vote required

5) Can be reconsidered

6) The proper terminology used is, "I move to amend the motion that ... by ..."

c. Ability 3 -- To direct an appeal from the decision of the chair. The purpose is to safeguard majority rule and prevent the chair from controlling the action of the body. A majority or tie vote sustains the chair. The announcement of any vote is not a decision of the chair and cannot be appealed from.

1) Second required
2) Debatable
3) Unamendable
4) Majority vote required
5) Can be reconsidered
6) The proper terminology used in carrying out this ability is, "Mr. Chairman, I appeal from the decision of the chair." In response, the chairman will state, "The decision of the chair has been appealed from."

d. Ability 4 -- To rise to a point of order. The purpose of this ability is to avoid breaking any parliamentary rule and to insist upon the enforcement of all rules. This is made only when a breach in procedure has occurred.

1) Second not required
2) Undebatable
3) Unamendable
4) No vote required
5) Cannot be reconsidered
6) The proper terminology for performing this ability is, "Mr. Chairman, I rise to point of order." In response, the chairman will say, "State your point." The member will rise and state the violation. The offending member may speak if he so chooses. If not, the chair will announce whether the point was sustained or not sustained.

e. Ability 5 -- To receive a motion of business with or without an amendment and receive a motion to lay it on the table. The purpose of this ability is to delay action on an item of business. This may be done to give members time to consider business of a more urgent nature. All amendments or other motions related to the original motion are tabled with the original motion.

1) Second required
2) Undebatable
3) Unamendable

4) Majority vote required
5) Cannot be reconsidered
6) The proper terminology for performing this ability is, "I move that we table the motion that ..."

f. Ability 6 -- To consider an item of business and receive a motion to refer it to a committee. The purpose of this ability is to make it possible to secure more detailed information as a basis for action. The chair may refer the original motion to a standing committee or appoint a special committee.

1) Second required
2) Debatable
3) Amendable
4) Majority vote required
5) Can be reconsidered
6) The proper terminology for performing this ability is, "I move that we refer the motion that ... to a committee (state the committee) for such action as it considers appropriate."

g. Ability 7 -- To receive a motion to reconsider. The purpose of this ability is to permit the reconsidering of a vote previously taken on a motion and to again reconsider the question. The person making this motion must have voted on the prevailing side.

1) Second required
2) Debatable if the motion to be reconsidered is debatable.
3) Unamendable
4) Majority vote required
5) Cannot be reconsidered
6) The proper terminology to use in performing this ability is, "I move that we reconsider the question of ..."

h. Ability 8 -- To receive a motion to take the original motion from the table, secure a vote, and, if favorable, consider the original motion. The purpose of this motion is to provide for additional consideration of a motion previously tabled.

1) Second required
2) Undebatable
3) Unamendable
4) Majority vote required
5) Cannot be reconsidered
6) The proper terminology used in performing this ability is, "I move that the motion ... be taken from the table."

i. Ability 9 -- To receive a motion to suspend the rules. The purpose of this motion is to permit the chapter to do something that cannot be done without violating its standing rules. This motion may be given prior to the item of business to which it pertains or it may be offered while the question is pending. The suspension of a rule is only in effect for the reason it was suspended.

1) Second required
2) Undebatable
3) Unamendable
4) 2/3 vote required
5) Cannot be reconsidered
6) The proper terminology for performing this ability is, "I move that we suspend the rule which states ..."

j. Ability 10 -- To receive a motion of business with or without an amendment and receive a motion to adjourn. The purpose of this motion is to terminate or close the meeting. The motion to adjourn comes to vote immediately after the second.

1) Second required
2) Undebatable
3) Unamendable
4) Majority vote required
5) Cannot be reconsidered
6) The proper terminology for performing this ability is, "I move that we adjourn."

k. Ability 11 -- To leave the chairman's station and later return to this station. The president should never leave the chair without asking the vice-president or some other officer to come to the chair. The president may state, "Will the vice-president please come to the chair?" The president gives the gavel to the vice-president upon leaving the chair and takes it back upon returning to the chair. Upon returning to the chair, the temporary presiding officer will inform the president what has transpired and what is before the House at that time.

1. Ability 12 -- To receive and dispose of a motion, its amendment, and an amendment to the amendment.

   1) Second required
   2) Debatable when motion to which it applies is debatable
   3) An amendment to the amendment is unamendable
   4) Majority vote required
   5) Can be reconsidered

C. Suggested Student Activities

1. Pass out 3 x 5 cards to students at random. Each card should have an ability written on it. Depending on what card each student received, he/she will stand up and explain the factual information regarding that ability.

2. Divide students into groups. Each group will perform three abilities as chosen by the instructor. Presiding officers will rotate within each group.

3. Divide class into two groups. Alternatively, each group will be asked a question. If that group cannot answer within 10 seconds, the other group has the same time to answer that question. One point per question be given each group for each correct answer. The group earning the most points will win. A reward or prize will be given at the discretion of the teacher.

INSTRUCTIONAL AREA: Agricultural Leadership

INSTRUCTIONAL UNIT IV: Participation in FFA Activities

LESSON 1: Contests, Awards, and Activities

I. Preparation for Instruction

A. Student Objectives*

1. Terminal: To participate in one or more official FFA activities.

2. Specific:

a. Make a presentation (speech, parliamentary demonstration, etc.) at the chapter level.
b. Compete for a position on at least one FFA contest team.
c. Participate in at least one activity above the chapter level (FFA camp, state convention, etc.)
d. Keep complete record of all participation.
e. Apply for all awards for which eligible.
f.

g.

h.

*Note: The format of this lesson is somewhat different from that of previous lessons. The purpose of this lesson is to provide hints to help teachers better prepare students for participation in FFA contests, awards, and activities.

B. Review Teaching Materials

1. FFA Advisors Handbook. National FFA Foundation. Alexandria, Va.: National FFA Supply Service, 1975.

2. Contest Bulletins. Baton Rouge: Louisiana State Department of Education, 1981.

3. FFA Chapter Activity Guide. Alexandria, Va.: National FFA Center, 1981.

4. Agricultural Proficiency Awards Reference. Washington, D.C.: National FFA Foundation, 1981.

5. National FFA Contests. Alexandria, Va.: National FFA Foundation, 1982-84.

6. Program Catalog. Alexandria, Va.: National FFA Center, 1982.

C. Special Arrangements

Materials

1. Copy of all contest scorecards
2. Proficiency and other award application forms
3. Previously completed award forms
4. Yearly calendar showing all contests, activities, and application due dates
5. Camera with film to record all chapter activities and members' individual accomplishments

II. Presentation of Lesson

A. Motivation

1. Show students pictures of previous winners, newspaper clippings of stories about winners, and plaques or other awards won by participants in the various contests.
2. Hold panel discussion with previous contest winners that addresses the importance, need, and processes of participating in contests and activities.
3. Use point system to increase grade of participating students.

B. Content Outline

1. General Contest Guidelines

   a. Preparation should begin several weeks before the first competition.

   b. All participants

      1) Must be FFA members in good standing,

      2) Must be high school students enrolled in Vo-Ag, and

      3) Must not have participated in the same contest on the national level.

   c. Area winners of the first four placings are eligible for state competition.

   d. State first place winners are eligible for national competition. (Exceptions: Pasture and Range, and Soils) (Transparency IV-1-A)

   e. First place individuals at state may not compete in that same contest in succeeding years.

   f. There will be no communication among contestants during contests.

   g. No coaches are allowed in the contest areas.

   h. Materials:

      Clipboard
      Several writing instruments - pens and pencils
      Black note paper
      Cordless calculators if applicable

2. Farm Business Management Contest

   a. Contest description: This competition tests students' knowledge of economic principles and their ability to use this knowledge in solving management problems.

There are two parts to the contest -- a multiple choice/true-false exam and a problem solving exam.

b. Suggestions for preparation:

1) Become familiar with economic terms,

2) Become familiar with economic principles, and

3) Use sample problems to practice calculations and decision making.

c. Materials needed for preparation and competition:

1) "National FFA Contests" Bulletin No. 4,

2) 1982 Contests' Questions and Answers (order through FFA Supply Service),

3) Additional references (p. 33, Bulletin No. 4),

4) Calculators (cordless for competition),

5) Pencils and erasers, and

6) Blank note paper.

3. Farm Welding Contest

A. Contest Description: A team of two will compete, one in Arc and one in Oxy-acetylenes. (Transparency IV-1-B and C)

Arc welders should be prepared to weld in the four basic positions and to choose their own electrodes to be used on a job or jobs assigned at the contest site.

Oxy-acetylenes welders should be prepared to weld with brass and to gas weld with or without filler rod. Students will select their own welding tips, filler rods, and pressure settings to perform the job or jobs assigned at the contest site.

(Deductions from each score will be made after 20 min.)

b. Suggestions for Preparation

1) Master four basic joints in the four basic positions,

2) Identify electrodes or tips to be used on all types and thicknesses of metal,

3) Practice sample jobs with a variety of materials,

4) Weld using different kinds or brands of welders or gas set-ups, and

5) Practice metal preparation including cleaning and beveling.

c. Materials needed for preparation and competition:

1) Sample jobs,

2) Score sheets from La. Bulletin No. 1663, and

3) Gloves, goggles, helmet, chipping hammer, and wire brush (Bring to contest).

4. Poultry and Egg Judging Contest

a. Contest Description: A team of three will place one or two classes of production hens and one class of pullets (20-22 weeks old). Animals should be judged on pigmentation and handling qualities, width of back, depth of body, and femininity. Hens will also be judged on their sexual maturity.

A class of 10 ready to cook poultry will be quality graded A, B, or C as they hang.

Eggs will be graded as follows:

One class--shell market eggs for interior quality,
One class--broken out for market quality, and

One class--shell market eggs for exterior quality (not to be handled).

Oral reasons are to be given on at least one of the production classes. Reasons should be accurate, convincing, and delivered in a concise, clear manner.

b. Suggestions for preparation

1) Become familiar with poultry and egg terms, conformation, USDA grades, and contest scorecards.

2) Practice judging and grading with realia as often as possible. Locate a source of culled chickens and eggs that can be used as samples. (See Animal Science, Lesson 6: Selecting and Judging Poultry).

3) After judging production class, compose a set of oral reasons and deliver them. Tape several sets and play them back.

Sample Reasons

"I am contestant number 10. I place this class of production White Leghorns hen 1-4-3-2.

"I placed number 1 at the top of the class and over number 4 because she is a bird that shows evidence of greater past production. She is completely bleached in all parts of her body while number 4 is showing small amounts of pigment on top of the toes. Both hens have refined heads and adequate body capacity and both are in production at the present time. I find these two birds to be a very close placing.

"I placed number 4 second and over number 3 because she is showing less pigment throughout her body, being completely bleached except the top of her toes. Number 3 is carrying large amounts of pigment in the hock and on top of the toes.

This showed me that number 4 had produced more eggs in the past than number 3.

"I placed number 3 third and over number 2. These birds were showing almost identical amounts of pigment. However, number 3 had more superior handling qualities than number 2. She had thin, pliable pubic bones and a softer more pliable abdomen, which indicated a greater past production.

"I placed number 2 at the bottom of the class because she was lacking in handling qualities and showed the most pigment of any bird in the class. These qualities demonstrated to me that she was the poorest past producer of eggs in the class.

For these reasons, I placed this class of egg production hens 1-4-3-2."

c. Materials needed for preparation and competition

1) LSU Cooperative Extension publication 1483

2) USDA Handbook No. 31, "Poultry Grading Manual."

3) Color Chart of U.S. Standards for Shell Eggs from Poultry and Dairy Quality Division, FSQS, USDA, Washington, D.C. 20250.

4) Forms 2, 9, 10-A, 10-B, and 10-C

5) Air Cell gauges available from Contest Department, National FFA Center, P. O. Box 15160, Alexandria, Virginia, 22309 (not to be used during the contest)

6) Eggs, live pullets and hens, and dressed ready to cook poultry

5. Meat Judging Contest

a. Contest Description: A team of three will evaluate and judge meat from cattle, sheep, and hogs. They may judge one or more classes of beef carcasses, beef wholesale cuts, pork carcasses, or lamb carcasses.

They may also yield grade and/or quality grade a class of no more than 10 beef carcasses.

Contestants will also identify species, primal cut, and retail name of 25 retail cuts.

There will be no handling of the meat or using of measuring devices.

b. Suggestions for preparation:

1) Students become familiar with skeletal and muscular system of the three species.

2) Study slides and wall charts of retail cuts. Proceed to a meat counter or packing plant for realia.

3) Use latest USDA standards to prepare for quality and yield grading. Begin with slides and progress to hanging carcasses.

4) Use "Meat Evaluation Handbook" with supplemental slides to study carcass judging.

5) Use "Uniform Retail Meat Identity Standards" to identify all retail cuts.

6) Practice using scorecards on practice classes (slides or real).

7) Watch a carcass being cut into retail cuts after students are familiar with skeleton and retail cuts.

c. Materials needed for preparation and competition:

1) "Meat Evaluation Handbook" -- Slides and wall charts,

2) "Uniform Retail Meat Identity Standards,"

The above are available from National Livestock and Meat Board, 36 South Wabash Ave, Chicago, Ill. 60603.

3) Ziegler, P.T. The Meat We Eat. Danville, Ill.: Interstate Printers and Publishers, 1966,

4) USDA Yield and Quality Grade Standards, and

5) Score card Forms 2, 5, 6, and 7. (Handout IV-1-A and B)

6. Dairy Cattle Judging Contest

a. Contest Description: A team of three contestants will place nine classes of four animals each from the five major breeds. They will also judge a class of dairy pedigrees on the basis of an animal's ability to transmit traits of production and type to its offspring.

Oral reasons will be given on one to three classes and should last no more than two minutes each.

b. Suggestions for preparation:

1) Identify parts of the dairy cow.

2) Identify the five major breeds (Holstein, Jersey, Guernsey, Brown Swiss, and Ayrshire) and their characteristics.

3) Describe ideal dairy type and character.

4) Identify common conformation defects in dairy cattle.

5) Identify the components of body capacity (length, width, and depth).

6) Describe an ideal mammary system and possible defects in a mammary system.

7) Practice judging by using pictures from books and slides. Progress to live animals.

8) Write and deliver a set of reasons for each class placed.

   a) Suggestions for reasons preparation and delivery include:

      (1) Stand erect, be at ease, and speak with confidence.

      (2) Start by correctly naming the class and give your placing. For example, "I place this class of aged Jersey cows 2-1-3-4."

      (3) Do not talk fast. Speak clearly and forcefully. Never chew gum when giving reasons.

      (4) Organize your reasons in a logical order.

      (5) Never attempt to memorize your reasons. Instead, try to develop a mental photograph of the animals in the class.

      (6) Reasons should be comparative, not descriptive.

      (7) Give most emphasis to important differences and give them first. Discuss minor differences last and only briefly.

      (8) Use the present tense in giving reasons -- she is, not she was.

      (9) Avoid use of general words such as "good," "nice," "better," etc.

      (10) Admit advantages of the poorer cow in the pair if

she is superior on some points. Use "I grant," "I admit," "I recognize," "I conceed," or "however."

(11) Use the correct terms for the parts of the cow. Spell them correctly and write neatly.

(See Animal Science, Lesson 4: Selecting and Judging Dairy Cattle)

b) A sample set of oral reasons:

I place this class of aged Holstein cows, 1-2-3-4. I place one over two and at the top of the class because she excels in general appearance. She is straighter of top line; her shoulders blend more smoothly with the body; she shows more width of loin and rump, with pin bones that are wider apart. She stands straighter and stronger on hind legs; however, I grant two has a more desirable udder, one that is more level on the floor and shows more quality.

I placed two over three because she has a larger udder that is attached higher and wider in the rear, is deeper, and has teats that are more squarely placed. Her udder is more level on the floor, with fore (front) attachment that blends in more smoothly with the barrel. Two excels in dairy character as shown by refinement throughout. She shows more length and leanness of neck and is sharper over the withers.

I placed three over four because she is a larger individual and shows more body capacity. Her barrel is deeper, larger, with a wider spring to the ribs. She has a greater depth of heart girth and more width of chest. Three is larger, wider, and more level of rump. She shows more strength to both fore and rear udder attachments.

I placed four last because she is a small individual and lacks depth and width of body. She has a weak head and is standing on crooked hind legs.

For these reasons, I placed this class of aged Holstein cows, 1-2-3-4.

c. Materials needed for preparation and competition:

1) "Judging Guide," Hoards Dairyman. Fort Atkinson, Wis.: W.D. Hoard and Sons, 1980.

2) "Your 4-H Dairy Calf," Baton Rouge: LSU Cooperation Extension Publication No. 1371, 1980.

3) Bundy, Clarence E., Ronald Diggins, and Virgil Christensen. Dairy Production. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1979.

4) Copies of Dairy Pedigrees available through LABC

5) Ensminger, M.E. Dairy Science. Danville, Ill.: Interstate Publishers, 1979.

6) Slides of all views of dairy cattle

7) Scorecard Form 2

8) Clipboard and pencils

7. Electrification/Energy Conservation Contest

a. Contest description: A team of two will compete, each performing separate tasks. One student will wire a wiring board following a written problem assigned at the contest site. This student will first draw a schematic and complete a wiring diagram of of the problem.

The other student will be tested on knowledge of energy conservation and identification of energy conservation materials.

b. Suggestions for preparation:

1) Study "Providing for Energy Efficiency in Homes and Small Buildings" Parts I, II, and III. (Student Workbook and Teacher's Guide) Oak Ridge, Tenn.: U. S. Department of Energy, 1980.

2) Acquire an understanding of circuits and become familiar with the Basic National Electric Code.

3) Demonstrate the ability to strip wire, gauge wire, make wire loops, and use wire nuts (solderless connectors) correctly.

4) Practice drawing and interpreting schematics and wiring diagrams for many sample problems.

5) Practice wiring the following:

    a) Fuse box or circuit breaker box,

    b) 2-way switch,

    c) 3-way switch,

    d) 4-way switch,

    e) Lighting outlet,

    f) Duplex receptacle, and

    g) Split-wired duplex receptacle.

6) Interpret schematics and diagrams to wire a board defined by sample problems.

7) Identify gauge of wire and type of cable to be used on sample jobs.

c. Materials necessary for preparation and competition:

1) Wiring board with service entrance panel,

2) 2, 3, and 4-way switches,

3) Duplex receptacles,

4) Lighting outlets,

5) Wiring tools and safety equipment,

6) "Maintaining the Lighting and Wiring System" AAVIM,

7) "Electrical Wiring-Residential, Utility Buildings, Service Areas" AAVIM,

8) "Understanding Electricity and Electrical Terms," AAVIM, and

9) "Providing for Energy Efficiency in Homes and Small Buildings" Parts I, II, and III, Student Workbook and Teacher's Guide.

Write for single copies:
U.S. Department of Energy
Technical Information Center
P. O. Box 62
Oak Ridge, Tenn. 37830

8. Agricultural Mechanics Contest--Small Engines

a. Description of Contest: A team of two will compete as follows. One member will assemble, using proper tools and techniques, a Briggs and Straton 4-cycle engine. The engine must operate for one minute at the end of the 50-minute time period. Time in minutes and seconds for assembly of an engine will be recorded for that contestant. Demerits are made according to the scorecard for poor workmanship.

The other member will trouble shoot another Briggs and Stratton 4-cycle engine using tools and test equipment supplied by the contestant. The contestant is to locate all malfunctions (bugs) in the engine, request replacement parts from the B&S manual # MS- 3222, install parts correctly, reassemble the engine, and set the idle at 1750 RPM then at 3200 RPM governed no load speed. Minutes and seconds for the assembly of a correctly assembled and running engine will be recorded with demerits for poor workmanship. Both contestants will complete an objective test (30-60 questions) concerning small engines and parts and parts number identification.

All scores will be added. The team with the lowest score will win.

b. Suggestions for preparation:

  1) Study principles of an internal combustion engine and the 4-cycle (stroke) small engine,

  2) Identify all engine parts and describe their function,

  3) Identify tools necessary to disassemble and assemble a small engine and describe their use,

  4) Practice assembly and concentrate on good workmanship and correctness, and build speed,

  5) Practice finding malfunctions, using the following basic order:

    (a) Spark,
    (b) AFM (air fuel mixture, carburation), and
    (c) Compression.

  6) Practice locating parts and numbers in "MS 3222."

  7) Become familiar with possible demerits on the score sheets.

c. Materials needed for preparation and competition:

1) Briggs and Stratton 4-cycle engine,

2) Standard and specialized tools and safety equipment,

3) "Small Engines," Vol. I and II AAVIM,

4) "Parts and Service Data MS 3222," Briggs and Stratton,

5) Score cards La. State Dept. of Ed., Bulletin 1555,

6) "Service and Repair Instructions," Briggs and Stratton, and

7) Pencils and/or pens.

9. Pasture and Range Contest

a. Contest Description: A team of three will compete in all three divisions of the contest in order to learn to maintain their natural range in top production and still make a profit with their livestock.

In Division I students are given, at the site, a condition or assumption sheet containing information such as number of acres, and pH, N, P, and K levels, etc. They then have 20 minutes to evaluate this unimproved area on four conditions and then make recommendations for range management practices.

In Division II students will identify by common name and classification approximately 20 plant specimens. They will state the major use, grazing value, and wildlife value of each specimen identified.

In Division III students proceed to a site of improved pasture and are given a condition or assumption sheet as in Division I. Students then have 20 minutes to evaluate the site on seven conditions and make recommendations concerning improvement practices.

Soil will be available at each site for texture and color evaluation.

b. Suggestions for preparation:

1) Use La. Bulletin 1547 as student reference (p. 19 further references), and

2) After students are familiar with terms and conditions, proceed to pastures and ranges for on site evaluation practice.

Students should practice:

a) Plant identification and classification (refer to pages 7-9),

b) Soil texture determination,

c) Drainage evaluation by color,

d) Slope determination, and

e) Identification of Pasture Groups.

c. Materials needed for preparation and competition:

1) La. Bulletin 1547, "Pasture and Range Contest"

2) Score cards for Division I, II, and III (Handout IV-1-C,D,E and F)

3) References listed in Bulletin 1547, p. 19

4) Plant specimens

5) Clip board, pencils, and pens

10. Livestock Judging Contest

a. Contest Description: A team of three will compete in all phases of the contest. Students will place at least four classes of animals (breeding or market sheep, beef, or swine) using 12 minutes for each class. At least one of these classes will be designated as an oral reasons class with five extra minutes allotted for reason preparation and two minutes for presentation.

Students will grade (using form 12) a maximum of 10 market swine according to the latest USDA market grades.

Students will grade on quality and yield (using form 13) a maximum of 10 slaughter cattle.

Students will grade (using form 13A) on frame size and muscle thickness a maximum of 10 feeder cattle according to the latest USDA market grades.

Students will select (using form 13B) the four best of eight females (beef and/or swine), using visual appraisal and performance data (supplied).

b. Suggestions for Preparation

1) Study

   a) Parts of livestock,

   b) Breed type,

   c) Sex type and character,

   d) Market type (ideal conformation),

   e) USDA grades, and

   f) Significance of performance data related to breeding animals.

2) Judge practice classes of livestock using pictures and slides. Proceed to live animals. (See Animal Science, Lesson 3: Selecting and Judging Beef Cattle)

3) Practice grading beef and hogs using the latest USDA grading system.

4) Practice selecting females based on conformation, breed, and sex type, feet and leg structure, and performance data. Performance data includes for beef: 205 day weaning weights; and for swine: days to reach 230 pounds, estimated back fat, and loin eye area. 90

5) Prepare and deliver a set of oral reasons for each practice class judged. A sample set for swine follows. (See Animal Science, Lesson 5: Selecting and Judging Swine)

"I placed this class of Duroc barrows 1-2-3-4. I started the class with one and placed him over two because one is a longer, stretchier, trimmer, more correctly balanced barrow that stands up on more length of leg than two. One has a longer, more uniformly arched topline, possesses a higher tail setting, is deeper through the ham with more bulge to the lower ham as viewed from the side and is trimmer and cleaner through the jowl, underline, and rear flank than two. One would hang a longer, trimmer, more uniformly balanced carcass than two. However, I grant that two exhibits more thickness and muscling through the lower portion of the ham and through both the inner and outer ham region. Two is also firmer at the base of the ham and through the crotch than one.

"For my middle pair I placed two over three because two is a larger, growthier, more rugged, more muscular barrow than three. Two has more spread and thickness down the top with a more correct turn over the top and expresses a meatier, heavier-muscled loin with more flare to the ham than three. Two has a greater total dimension to the ham and displays a thicker, more prominent stifle muscle area at the move than three. Two possesses a ham that laces higher into the loin and farther into the side, stands out wider behind, and is firmer through the crotch than three. Two will hang a meatier, more muscular carcass that will yield a higher percent of ham and loin than three. On the other hand, I grant that three is a taller, more upstanding barrow that displays a stronger, more uniformly arched topline, has more bulge to the ham as viewed from the side and is trimmer and tighter through the middle and rear flank than two.

"Coming to my bottom pair, I placed three over four as three is a meatier, heavier-muscled, more uniformly balanced, trimmer, more correctly finished barrow than four. Three displays a more desirable turn over the top being cleaner over the point of the shoulder, at the point of the elbow and all down the top than four. Three is thicker over the loin and comes back with more flare to the ham and is squarer out over the rump than four. Three possesses a thicker, more muscular ham, stands out wider behind and is especially trimmer and neater about the jowl, underline, and rear flank than four. Three will hang a trimmer, cleaner, more muscular carcass that will yield a higher percent of lean cuts than four. However, I grant that four exhibits a stronger, more uniformly arched topline and possesses a longer rump and a higher tail setting than three. Four also shows more thickness through the inner ham, is cleaner through the crotch and is a more rugged, heavier-boned barrow than three; but I criticized four and placed him at the bottom of the class because he is heavy-fronted, lacks balance, and is carrying too much finish down over the top and through the jowl, underline, and rear flank to place any higher in this class today."

For these reasons I placed this class of Duroc barrows 1-2-3-4.

c. Materials needed for preparation and competition

1) Score cards -- Forms 2, 12, 13, 13A, and 13B

2) La. State Department of Education Bulletin 1546

3) Hunsley, Roger E., Malcolm Beeson, and Julius Norby. Livestock Judging Selection and Evaluation. Danville, Ill.: Interstate Publishers, 1978.

4) Current information on USDA grades. Livestock - Poultry - Grain - Seed Division, Ag. Marketing Service, USDA Washington, D.C. 20250.

5) Extension Folder 436, Pork Carcass and Slaughter Swine Grading, Ag. Extension Service, Univ. of Minnesota, St. Paul, MN 55108

6) Slides, pictures, live animals

7) Slides showing live animals with their respective carcass

8) Clip board and several pencils

11. Forestry Judging Contest

a. Contest Description: A team of three will participate in all four sections of the contest.

Students will identify (by printing) 10 of the 43 trees eligible for use in the contest (Bulletin Forestry Guide, p. 6). Four points for common name, two points for botanical name and two points for correct characteristic will be awarded. One point will be deducted for misspelling the common name and ½ point for misspelling the botanical name. Forty seconds will be allowed for each tree. (Handout IV-1-G)

Students will decide, using visual appraisal and information provided, whether to remove, leave, or deaden 10 trees. Five points will be awarded for each correct decision. (Handout IV-1-H)

Students will determine Diameter at Breast Height, number 16 foot logs, and number of board feet for 10 trees, translate this into total volume and value for one acre. 10 trees = ¼ acre (Handout IV-1-I)

Students will determine D.B.H., height, and volume in cubic feet for 10 trees, convert this to vol/acre, cords/acre, and total value per acre. 10 trees = ¼ acre (Handout IV-1-J)

Students may be asked to pace a minimum of 10 chains with one point being deducted for every foot off the correct measured distance.

b. Suggestions for Preparation

1) Use the publication Commercial Trees of Louisiana, by Claire A. Brown, as the official study guide for tree identification.

2) Study reasons and theories behind timber stand improvement and/or thinning.

3) Master pacing 66 feet.

4) Practice the two uses of the tree-scale stick, measuring diameter and height.

5) Practice using the Doyle scale and the Cubic Foot Volume table with the D.B.H. and height.

6) Practice arithmetic necessary to determine volume and values for ¼ and one acre.

7) Practice all sections of the contest in as many forests and terrains as possible.

8) Study rules and measurement standards carefully.

c. Materials for preparation and competition

1) "Study Guide for Forestry Judging Contest for Louisiana FFA." La. Bulletin, 1978.

2) Score Sheets. Commercial Tree Identification, TST and/or Thinning, Sawlog score sheet, and Pulpwood score sheet.

3) Tree Scale Stick

4) "Commercial Trees of Louisiana," Bulletin 10 - 4th Edition, 1964 by Claire A. Brown

5) Clip board, pencils, and erasers

12. Milk Quality and Dairy Foods Contest

a. Contest Description: A team of three will compete in all phases of the contest.

Using Form 3 (Handout IV-1-K) Students will score no more than 10 milk samples on flavor, no more than 10 sediment pads on degree of sediment, and identify no more than 10 cheese samples. A 25 item objective test on milk production will be completed.

Using Form 4 (Handout IV-1-L) Students will score no more than 10 cottage cheese samples on flavor, and no more than 10 milker unit parts on defects. A 25 item objective test on milk marketing will be completed.

b. Suggestions for Preparation

1) Use Farmers Bulletin 2259 as your official study and training guide.

2) Practice distinguishing sweet, sour, salty, and bitter using prepared milk samples (p. 2).

3) Study possible off flavors and prepare and taste samples (p. 6).

4) Practice using the score card!!!!
40 pts. = excellent quality
31 pts. = unacceptable

5) Repeat practices with cottage cheese using correct tasting techniques

6) Practice scoring milker parts. One point is deducted from 10 for each defect (p. 11).

7) Practice scoring sediment pads according to examples (p. 12 FB. 2259).

8) Practice identifying the 14 cheese varieties by appearance, smell, and taste (pp. 13 and 14).

9) Study test material (USDA Bulletin AMS 559) etc.

c. Materials for preparation and competition:

1) Milk, cottage cheese, cheese varieties, cups, spoons, paper plates, quinine sulfate, silage, heat source, flash, stoppers, tubing, water (distilled), chlorine, cultured buttermilk, malt flavor or grape nuts, strainer, garlic and/or onion flavor, musty hay, copper sulfate or a copper penny, raw milk either or butyric acid, salt, sediment pads, and milker units,

2) Score card Form 3 and 4,

3) "Judging and Scoring Milk and Cheese," Farmer's Bulletin No. 2259, USDA U. S. Government Printing Office, Washington D. C. 20402,

4) "Sediment Standard Charts," USDA, 96

5) "Cheese," National Dairy Council, 6300 N. River Rd., Rosemont, Ill. 60018,

6) "Cheese Varieties," USDA Handbook 54,

7) "How to Buy Cheese," USDA Home and Garden Bulletin No. 193, and

8) "Questions and Answers on Federal Marketing Orders," USDA AMS Bulletin 559.

13. Soil Judging Contest

a. Contest Description: A team of four will compete individually in all sections of the contest. Four separate sites designated by the contest officials will be evaluated. Students will determine surface texture, permeability, depth of soil, slope, wind and water erosion, surface run off, major limiting factors, land capability class, and recommended soil treatments for each site using scorecard NL-1. At each site students should receive a scorecard and the field or site conditions to help in its evaluation. Approximately 20 minutes will be allowed at each site.

The team score will comprise the members' three highest total scores.

b. Suggestions for preparation

1) Use Bulletin 1505 and Soil Science Lesson plans (See Soil Science, Lesson: Conducting Soil Judging Contest) as your study and training guide.

2) Practice slope determination using a hand level or transit. No device for slope measurement may be used at the contest.

3) Practice using the scorecard as a measuring device. No rulers may be used at the contest.

4) Practice texture determination with and without the use of water. Provide your own water for the contest.

c. Materials needed for preparation and competition:

1) La. Bulletin No. 1505,

2) Soil Survey Maps,

3) Soil Profiles,

4) Scorecard NL-1,

5) Knife, rule, water, level or transit,

6) Machinery to dig pit, and

7) Clip board and pencils.

14. Nursery/Landscape Contest

a. Contest Description: A team consisting of three members will participate in all three phases of the contest. Using Form 14 students will identify 25 specimens of a possible 48 plants. Contestants will place, using Form 2, five classes of Nursery/Landscape plants based on their size, form, density, color, and blemishes. A 50 item objective exam will be completed by all contestants. (Handout IV-1-M)

b. Suggestions for preparation

Use Louisiana Bulletin 1548 as the study and training guide.

c. Materials needed for preparation and competition:

1) Plant specimens and/or pictures of all 48 plants,

2) Classes of plants for practice judging,

3) Scorecards Form 2, 14,

4) Bulletin 1548,

5) American Standard For Nursery Stock 1973, AAN, Washington, D. C.,

6) Bailey, L.H. Hortus Third. New York: The Macmillan Co., 1977, and

7) Clip board and pencils.

15. Parliamentary Procedure Contest

a. Contest Description: A team of six members is allowed 15 minutes to demonstrate the procedure for three of the 12 abilities listed in "Helps in Mastering Parliamentary Procecure." Judges will select a different chairperson for the demonstration of each ability. They will also select the abilities to be demonstrated and the item of business on which to base the discussion. Students may be asked questions as to how they would act in certain situations either as a presiding officer or as a member.

b. Suggestions for preparation

1) Use W. F. Stewarts, "Helps in Mastering Parliamentary Procedure" and the lesson plan (See Agricultural Leadership, Lesson 2: Parliamentary Law) as the study and training guide.

2) Have younger members attend a local or district Parliamentary Procedure contest.

c. Materials needed for preparation and competition:

1) Each member, "Helps in Mastering Parliamentary Procedure,"

2) La. Bulletin No. 1540,

3) Timing device, and

4) Official FFA dress.

16. Prepared Public Speaking Contest

    a. Contest Description: An individual contestant is allowed 6 to 8 minutes to present a speech prepared by the contestant. The topic will be agriculturally related. Students will respond to questions from the judge for a 5-minute period following the speech. (Handout IV-1-N)

    A manuscript with a bibliography and quotations identified must be submitted prior to the contest according to specific contest regulations.

    b. Suggestions for preparation

        1) Use Bulletin 1541 and lesson plan (See Agricultural Leadership, Lesson 1: Public Speaking) as study and training guides.

        2) Prepare manuscript. Reread several times and make corrections.

        3) Record on tape, play back, and make amendments to the text.

        4) Practice speaking before a mirror and to small groups.

        5) Always tape a trial presentation.

    c. Materials necessary for preparation and competition:

        1) La. Bulletin 1541,

        2) National FFA Bulletin No. 4,

        3) La. Curriculum Vo-Ag I and II,

        4) Tape recorder, tape, typewriter, pencils, mirror, stop watch, and

        5) Official FFA dress.

17. Extemporaneous Public Speaking Contest

a. Contest Description: Individual 100 contestants are allowed 30 minutes to prepare a speech on a topic chosen at random from three categories (Vocational Agriculture, FFA, and Agricultural Industry). Students are to use approved materials only during the preparation period. The speech is to last from 4 to 6 minutes followed by 5 minutes of questioning by the judges. (Handout IV-1-O)

b. Suggestions for preparation

   1) Use Bulletin 1541 and lesson plan (See Agricultural Leadership, Lesson 1: Public Speaking) as study and training guides.

   2) Practice preparing speeches from the three categories and present them.

   3) Practice in front of a mirror and record all trial speeches. Identify problems to be corrected carefully.

   4) Select references to be taken to the contest. (No more than five items of printed material) (See rules)

   5) Become familiar with the rules and score sheet.

c. Materials needed for preparation and competition:

   1) La. Bulletin 1541,

   2) National FFA Bulletin No. 4,

   3) Lesson Plans La Vo-Ag I and II curriculum,

   4) References on three topic areas,

   5) Mirror, clock, tape recorder, tape, paper, pens, pencils, and note cards, and

6) Official FFA dress.

18. National FFA Convention

a. Activity Description: A four-day convention held in early November for recognition of outstanding members and to provide other educational activities for delegates (speakers, tours) Noteworthy events and activities include:

FFA Band (apply through State Department of Education)
FFA Chorus (apply through State Department of Education)
FFA Courtesy Corps/Arena Crew
Agricultural Career Show
National FFA Organization Exhibits
Educational Tours
National Contests
Business Sessions
Keynote Speakers
FFA Talent Revue (apply through State Department of Education)
Truman Library Tour
Agricultural Hall of Fame Tour

b. Suggestions for preparation:

1) Show latest slide show describing the convention "Sights and Sounds of the National FFA Convention."

2) Describe method of chapter delegate selection.

3) Identify costs for each student delegate. Food ($15/day), lodging ($15/day), transportation (variable), and misc.

4) Select delegates.

5) Make arrangements, lodging, transportation, parental permission, etc.

6) Wear official FFA dress.

7) Make and follow an itinerary.

8) Take photographs or slides.

9) Write thank-you notes if applicable.

10) Have delegates present a program to the chapter on the trip to Kansas City.

c. Materials needed

1) "Sights and Sounds of the National FFA Convention." (available through FFA supply service),

2) Slide projector, cassette recorder, and screen,

3) Approximately $200/person,

4) Camera and film, and

5) Official FFA dress.

19. FFA State Convention

a. Activity Description: A four-day convention held in early June, for conducting organizational business, recognizing outstanding individuals and teams, and to provide educational activities for delegates.

Noteworthy events and activities include:

Business sessions,
Public speaking contests,
Courtesy Corps.,
Convention organists,
Keynote addresses,
Career exhibits,
Committee meetings, and
Educational tours.

b. Suggestions for preparation and participation:

1) Show slides and/or pictures of last year's convention highlights. Discuss the purpose of the convention.

2) Describe how chapter delegates are selected.

3) Identify expenses for each student delegate. Food ($15/day), lodging ($15/day), transportation (variable) and miscellaneous.

4) Instruct delegates to wear the official FFA dress.

5) Establish scholarships or loans through the chapter treasury for delegates.

6) Select delegates.

7) Make arrangements (lodging, transportation, parental permission, etc).

8) Use convention program to plan an itinerary. (Follow the itinerary.)

9) Take photographs and slides.

10) Write thank-you notes if applicable.

c. Materials needed

1) Slides, projector, screen

2) Approximately $175/person

3) Camera, film

4) Official FFA dress

20. Louisiana FFA Summer Leadership Training Conferences, Bunkie Youth Center.

a. Activity Description: A four-day camp-style conference where participants increase their knowledge of the Vo-Ag/FFA program and acquire skills to improve their chapters.

There are five parts to the camp:

1) Chapter officer groups -- receive additional training in an office 3 hrs/week,

2) Committee groups -- become a member of a working committee,

3) FFA activity groups -- information is presented on various FFA individual and chapter activities,

4) Recreation -- planned games, and

5) Free-time -- 4 hrs/day.

Members are encouraged to run for Area FFA Office, and the candidates are encouraged to preside during general camp sessions.

b. Suggestions for preparation:

1) Describe camp to underclassmen.

2) Identify dates, requirements, cost ($40), and method of selection for camp.

3) Complete and mail in applications for selected students and teachers.

4) Take along - official FFA dress and sports clothes.

5) Participate in all activities and make notes to be taken back to the chapter.

6) Take some pictures that will interest others in camp next year.

7) Write a news article for the home town paper. Include names of those who participated and what happened.

c. Materials needed

1) Camp application

2) Camp fee

3) Camera, film

4) Official FFA dress

5) Sports clothes

6) Extra money

7) Notebook, pens, and pencils

21. Washington Leadership Conference (Summer)

a. Activity Description: A five-day conference designed to further develop leadership confidence and skills. Time is spent meeting National FFA Officers, working with counselors developing skills, touring the Washington D.C. area, and meeting FFA members from all areas of the country. A maximum of two officers per chapter may attend (no state officers or graduating seniors). Cost in 1982-student, $250 (includes room, meals, and conference materials).

b. Suggestions for preparation and participation:

1) After new officers have been elected, present information on WLC at an executive meeting [purpose, dates, cost ($250 and transportation)].

2) Describe selection procedure for the two participants.

3) Arrange for partial/full scholarships or sponsorships for participants.

4) Make arrangements (application, transportation, parental permission, etc.

5) Outline rules to the participants. Stress participation in all sessions.

6) Take pictures, keep notes, and collect all materials.

7) Share ideas with fellow officers and chapter members.

c. Materials needed

1) WLC Program Application Form and Brochure (available from National FFA Center)

2) $250 per student plus transportation

3) Official FFA dress

4) Camera and film

5) Pens and pencils

22. FFA Achievement Award Program

a. Program Description: A personally planned set of activities in your area of interest. Activity areas to include vocational skills, leadership, career understanding, and safety. Student progress toward achievement is monitored using a wall chart or other recording device. Members achieving set goals (80% or greater) in the time period set will receive an Achievement Award Certificate.

b. Suggestions for preparation and participation:

1) Use "FFA Achievement Award Guide" as a plan for implementing a program.

2) Develop a checklist of vocational skills, leadership activities, career understanding activities, and safety practices that students may choose to achieve.

3) Students work individually with instructor to plan personal goals in the four areas.

4) Keep record of achievement.

5) Order certificates.

6) Recognize all achievers at an annual banquet.

c. Materials needed

1) FFA Advisors Handbook, 1975
National FFA Center

2) "FFA Achievement Award Guide," National FFA Center

3) Copies of skills and activities checklist

4) Blank forms for personal plans

5) Record keeping system

6) Achievement Award Certificate

23. Proficiency Awards Program

a. Program Description: A program operated at the chapter, district, area, state, regional, and national levels. Members who qualify complete application in at least one of 22 areas. In order to do well in competition students must have kept good records and must be able to present supporting evidence (photographs) of the written words.

Accuracy, clarity, and neatness are important aspects of each application. Completed applications should convey to judges the scope and achievements of the student in that proficiency award area.

Application areas include Scope, Earned Income, Inventory, Financial Statement, Related Activities, Marketing Experience, Efficiences, Skills and Competencies, Improved Practices, Achievements and Accomplishments, Experiences Gained, Safety, Leadership Development, and other information with supporting evidence.

b. Suggestions for preparation and participation

1) Introduce the Proficiency Award Program to freshmen students so that they may plan their programs.

2) Use "Agricultural Proficiency Awards" reference as your guide to the program.

3) Supply freshmen with copies of applications in their area(s) of interest.

4) Keep records of all SOEP, Vo-Ag, and FFA activities.

5) In January each year, complete practice applications. (Submit the best from the chapter.)

6) Take photographs during a project (not two years later).

7) Keep a file of old applications to use as examples.

8) Type all final applications.

9) Read carefully all forms and follow directions. Some applications require that record books be submitted.

10) Have applications signed by each person as indicated on page 1.

11) Submit by deadline.

c. Materials needed

1) Current "Program Catalog," "FFA Advisors Handbook," "Agricultural Proficiency Awards," and "National Agricultural Proficiency Award Application Forms." Available through the National FFA Center.

2) Previously completed applications

3) Student records

4) Camera and film

5) Typewriter

24. Rice Essay Contest

a. Contest Description: A Louisiana contest designed for students to learn more about good seed rice and what it means to others.

Members will submit an essay of approximately 400-500 words on the value of good seed rice. Essays may be hand written or typed. The parish will submit the highest-scored essay to the LSU Cooperative Extension Service according to the most recent contest rules.

The first place FFA member receives a $75 bond and the second place FFA member receives a $50 bond from the Louisiana Seed Rice Growers Association.

b. Suggestion for Preparation

1) Describe contest and rules to students.

2) Keep a file of Seed Rice information for student reference.

3) Correct student's first draft. (Perhaps an English instructor would proofread the essay)

4) Submit by deadline.

c. Materials needed

1) Rules and contest guidelines

2) Seed rice references

3) Paper, pencils, and typewriter

25. Food for America Program

a. Program Description: The FFA's effort to tell the story of agriculture to school children. Members present a program about the importance of farming and agribusiness to elementary school students. Pictures, films, and realia are used to tell the story.

b. Suggestions for preparation and participation:

1) Appoint a "Food for America" committee,

2) Order "Food for America Kit" from National FFA Center (free),

3) Obtain permission for the program from teachers and administrators,

4) Use community members to supply realia and/or tours,

5) Wear official FFA dress,

6) Have members prepare short lessons to present to the children,

7) Use one of the two films available to get the points across,

8) Take pictures and supply the local media with pictures and information (the story),

9) Call the media one week prior to the event (they may want to be there), and

10) Have something (however small) for each child to take home to remember the day.

c. Materials needed

1) "Food for America" Handbook and Kit, National FFA Center

2) "Food from Farm to You," Grange Farm Film Foundation, 1616 H Street, N.W., Washington D. C. 20006

3) "Food for America," National FFA supply or Venard Films LTD., Box 1332, Peoria, Ill. 61654

4) Transportation

5) 16mm film projector and screen

6) Camera, black and white film, slide film

7) Realia (grain, eggs, vegetables, milk, etc.)

8) Student take-home gift

26. Chapter Safety Award Program

a. Program Description: Members are involved in planning and implementing a safety program in the shop or classroom on the farm and in the communities. This program may include chemical safety, color coding, safety demonstrations, fire prevention, equipment safety, and electrical and recreational safety.

Each year chapters apply for awards at the state and national level.

b. Suggestions for preparation and participation:

1) Use the FFA Activity Handbook as your program guide.

2) Select a safety committee.

3) Plan activities and projects to be completed (for example, a tractor operations workshop).

4) Schedule all activities and assign duties (get all members involved).

5) Supply the media with the dates and activities.

6) Take pictures of activities and completed projects.

7) Have students keep personal records of their involvement.

8) Order safety films during the summer.

9) Record all activities.

10) Complete the application by the deadline.

c. Materials needed

1) "FFA Activity Handbook," "FFA Advisor's Handbook," National FFA Center

2) Films, 16mm projector screen

3) Materials for particular projects (colored paint)

4) Camera and film

5) Record system

6) National Chapter Safety Award Program Application Form I and II

7) Typewriter

27. Building Our American Communities Program

a. Program Description: The Chapter cooperates with the communities to make them a better place to live and work. Activities and projects are planned with each group donating their time or money to accomplish the goal. Each BOAC project is unique depending on the community's needs.

Chapters (Phase I) and individual members (Phase II) are eligible for awards.

b. Suggestions for preparation and participation:

1) Use the BOAC reference in the FFA activity guide to help plan and implement the program.

2) Show "Hometown America" at a chapter meeting.

3) Select a BOAC committee.

4) Contact community organizations to discover community needs.

5) Plan (with the cooperating organizations) the project to be accomplished.

6) Take pictures.

7) Keep records (time and money spent).

8) Notify media of activities as they progress.

9) Apply for awards at the first level of competition (area or state).

10) Present the FFA-BOAC certificate to individuals and groups that were actively involved in the program.

c. Materials needed

1) "FFA Activity Handbook," "FFA Advisors Handbook," National FFA Center

2) Film, "Hometown America," Venard Farm Films LTD, Box 1332, Peoria, Illinois 61554

3) 16mm projector and screen

4) Camera and film

5) Record system

6) BOAC report form and application for State and National recognition from National FFA Center

7) Typewriter

28. FFA Energy Challenge

a. Program Description: A program of activity and awards designed to encourage FFA chapters to conserve energy on a broad scale.

Awards are based on a 12-month activity period beginning and ending on April 15.

The report is scored on these four factors:

1) The percentage of FFA members involved,

2) The extent of the involvement of the FFA members,

3) The quality and appropriateness of activities, and

4) The extent of community involvement and outside agencies providing assistance.

Plaques are awarded to the four Area winners and the State winner. Regional winners receive $500 and a plaque with the National winning chapter receiving $1,000 and a plaque.

b. Suggestions for preparation:

1) Select an Energy Conservation Committee,

2) Plan conservation activities for the 12-month period involving as many FFA and community members as possible,

3) Keep record of all activities (pictures, news articles, calendar),

4) Complete application. Be precise, descriptive, and neat. Follow directions, and

5) Submit by deadline.

c. Materials needed

1) Rules and Program Guidelines

2) Camera and film

3) Scrapbook

4) Application form

5) Typewriter

29. National Chapter Award Program

a. Program Description: A method of providing recognition for those chapters with organized and functioning "Programs of Activities." Chapters submit Form I to be evaluated at the State level. States submit two chapters or

10 percent of their State Superior rated chapters that have completed both forms I and II for National consideration.

b. Suggestions for preparation:

  1) Use "FFA Advisor's Handbook" for your guide to program participation,

  2) Develop and implement a program of activities,

  3) Select standing committee members and arrange for committee meetings (this implements "2"),

  4) Record activities (pictures, news-articles, scrapbook),

  5) Complete applications neatly and according to directions, and

  6) Submit by deadline.

c. Materials needed

  1) Program of activities copy for each member

  2) FFA Advisors Handbook

  3) FFA Activity Guide

  4) Application

  5) Camera and film

  6) Typewriter

30. Livestock Enterprise Awards

  a. Awards Description

    1) Superintendent of Education Award. Awarded to outstanding third year FFA member in regard to progress in livestock production and exhibition during the first two calender years as a member.

    2) Governor's Award. Awarded to the outstanding fourth year FFA member with a beef or dairy enterprise who has excelled in the area of livestock production. (Note: One and two are presented at the LSU State Junior Livestock Show. The winner must exhibit at the show in order to receive the award.)

    3) President's Award. Awarded to the outstanding fourth year FFA member in livestock production who has exhibited at the Southern University Livestock and Poultry Show the current year and the year immediately preceding. Presented at the Southern University show each year.

    4) For each of the above awards entrants must complete the application, including a 200-300 word narrative report as outlined in the rules. If the applications warrant, top individuals will be visited to determine the winner.

b. Suggestions for Participation

    1) Acquire application forms from the Louisiana Department of Education.

    2) Make a list of requirements for eligibility for each award.

    3) Have eligible students complete the application making sure that their SOE records are reflected by it.

    4) Select the outstanding individual from the chapter and submit his/her application by the deadline.

    5) Make sure the application is neat, contains correct information, and that the person selected will be exhibiting at the appropriate show.

c. Materials needed

    1) SOE Records

2) Application forms

3) Paper, pencil, and typewriter

31. MFC Livestock Exhibition Award

a. Award Description

Chapters will be scored according to a published system awarding points for entries, winnings, placings, clean aisle awards, showmanship at five shows, and being selected for one of the educational trips. Chapters must submit their entries and winnings for Louisiana State Fair, District Jr. Livestock Show, LSU Spring Livestock show, Southern University Livestock show, and the Dixie Jubilee by the deadline.

The Chapter accumulating the highest number of points over the entire year will win the award. All chapters will be rated Gold, Silver, or Bronze and receive a certificate. Cash awards and banners will be awarded to the top four chapters at the FFA state convention.

b. Suggestions for participation

1) Obtain guidelines, a score sheet, and the scoring system for the award.

2) After each show, tally the number of entries and placings and complete the section of the score sheet for each show.

3) Complete and submit the score sheet by the deadline, making sure that all information is accurate.

c. Materials needed

1) Award guidelines, system for scoring, and score sheet/application from the State Department of Education, and

2) Records of each show.

32. Funk's G-Hybrid 304 Bushel Challenge Contest

a. Contest Description:

Members, using recommended cultural practices, plant seed corn furnished by Funk's seed International, Alexandria, Louisiana and attempt to surpass the 304 bushel/acre record. The three top yields at the state level are recognized along with the three top yields from each of the four state areas.

b. Suggestions for participation

1) Obtain rules, entry forms, and seed corn from

   District Sales Manager
   Funks Seeds International
   Box 7498
   Alexandria, La. 71301

2) Till, plant, apply pesticides, and cultivate according to recommendations for top production.

3) Follow instructions for field measurement, harvesting, and weighing of crop.

4) Complete and submit the application by the deadline. Be sure all information is neat and correct.

c. Materials needed

1) Regulations, entry form, and seed corn

2) Soil test

3) Lime and fertilizer as recommended by soil test

4) Tractor, tillage, planting, and harvesting equipment

5) Pesticides and application equipment

6) Land measuring devices

7) Certified scale or weighmaster

33. Junior Beef Grazing Project Contest

a. Contest Description

Members will raise a pen of eight commercial beef animals on five acres of pasture for approximately 150 days. Weigh-in times and places will be designated after all entries are in. At weigh-in calves will be tatooed or tagged and weighed, priced, and graded. At weigh-off animals are weighed, priced, and graded again.

Projects are scored on:

1) total pounds gained,
2) change of grade,
3) increase in selling price, and
4) cost per pound of gain.

Cost and management records must be submitted at the end of the project. These will be kept on an official record form furnished by the State Extension specialist.

b. Suggestions for participation

1) Obtain Rules and entry blanks from the State Department of Education or the Louisiana Cooperative Extension Service (Beef Specialist).

2) Obtain eight calves (one sex) weighing no more than a total of 3,200 pounds.

3) Follow instructions for weigh-in, feeding, and weigh-off.

4) Submit required records that are neat and accurate by the deadline.

c. Materials needed

1) Rules, entry form, and official record form for the project,

2) Five acres winter pasture/pen of eight animals,

3) Eight commercial beef calves 3,200 pounds; one alternate animal may be designated in the pen,

4) Transportation to weigh station,

5) Minerals, salt, and a source of clean drinking water, and

6) Hay or silage in time of dry weather or bad pasture.

34. Annual Parent-Member Banquet

a. Activity Description:

A traditional feast and time for recognition of members, parents, advisors, and other community members. The banquet is an excellent public relations tool to which school staff and community members can be invited to see and hear what the chapter has accomplished in the past year. The meal is preceded by a welcome and an invocation. It is followed by recognition of members, guests, a keynote speaker (a state FFA officer does well here), presentation of Honorary Chapter Degrees, and the installation of the new chapter officers.

b. Suggestions for preparation and participation

1) Select a banquet committee or divide the chapter into banquet committees:

a) Menu and food,

b) Program (Emcee, speaker, agenda, programs),

c) Invitations,

d) Publicity and decorations,

e) Set-up and clean-up, and

f) Entertainment.

2) Use FFA Advisor's Handbook as your banquet preparation guide.

3) Set your date several months in advance and select the location.

4) Contact the State Department of Education to secure a State FFA Officer as your speaker.

5) Provide the members and special guests' meals free of charge if possible.

6) Choose the serving style for the meal-sit down, family style, or buffet.

7) Contact several people for prices and menus.

8) Involve as many members as possible in the program. Do not necessarily appoint chapter officers as the Masters of Ceremonies.

9) Prepare pre- and post-banquet articles. Deliver these to the newspaper early so they may be edited and used.

10) Plan a smooth system of award presentations. Practice once before the banquet. Use different members to announce different awards. You may wish to have the principal, superintendent, or other community member actually present the award and shake the recipient's hand.

11) Take candid pictures of people enjoying themselves. Only take posed pictures before or after the ceremonies.

12) Don't drag the banquet out. Two to 2½ hours should be your goal.

13) Be prepared.

c. Materials needed

1) FFA Advisor's Handbook,

2) Old copies of programs, invitations, tickets, and the agenda (what the Emcee says and does),

3) Placemats, table coverings, and decorations,

4) Awards and certificates (order early),

5) Public address system (set up and tested prior to guests arriving), and

6) Camera and film.

C. Suggested Student Activities

Student activities were listed at each respective heading for contests, awards, and activities.

FFA CONTESTS
AND
LEVELS OF COMPETITION

	NO. ON TEAM	LOCAL	PARISH	DISTRICT	AREA	STATE	TRI-STATE	REGIONAL	NATIONAL	INTERNATIONAL
FORESTRY	3				X	X	X			
SOILS	3					X				X
PARLIAMENTARY PROCEDURE	6		X	X	X	X				
PUBLIC SPEAKING	1		X	X	X	X	X	X	X	
EXTEMPORANEOUS PUBLIC SPEAKING	1	X	X	X	X	X	X	X	X	
DAIRY CATTLE	3				X	X			X	
MILK QUALITY AND DAIRY FOODS	3				X	X			X	
MEATS	3				X	X			X	
POULTRY	3				X	X			X	
LIVESTOCK	3				X	X			X	
PASTURE AND RANGE	3				X	X				
NURSERY/LANDSCAPE	3				X	X			X	
ELECTRIFICATION/ENERGY CONSERVATION	2				X	X				
WELDING	2				X	X				
SMALL ENGINES	2		X	X	X	X				
FARM BUSINESS MANAGEMENT	3					X			X	

FOR FFA CONTEST PURPOSES, THE STATE OF LOUISIANA IS DIVIDED INTO 4 AREAS AND 16 DISTRICTS.

TRANSPARENCY IV-I-A

JUDGING CRITERIA
FOR
OXYACETYLENE WELDING CONTEST

OXYACETYLINE WELDING

POSSIBLE SCORE	CRITERIA	CONTESTANT'S SCORE
20	A. GAUGE SETTING	________
10	B. CHOICE OF WELDING TIPS	________
5	C. PREPARATION OF MATERIALS	________
20	D. UNIFORMITY OF BEAD	________
20	E. PENETRATION OF WELD	________
5	F. TERMINATION OF WELD	________
5	G. TIME	________
5	H. NEATNESS	________
5	I. CHOICE OF WELDING ROD	________
5	J. USE OF FLUX	________

CUT-OFF TIME IS 25 MINUTES. DEDUCT ONE POINT FOR EACH MINUTE OR FRACTION THEREOF, OVER 20 MINUTES.

TOTAL SCORE ________

TRANSPARENCY IV-I-B

JUDGING CRITERIA
FOR
ARC WELDING CONTEST

ARC WELDING

CONTESTANT NO._____

POSSIBLE SCORE		CRITERIA	CONTESTANT'S SCORE
20	A.	MACHINE SETTING	________
10	B.	CHOICE OF ELECTRODES	________
5	C.	PREPARATION OF MATERIAL	________
20	D.	UNIFORMITY OF BEAD	________
5	E.	JOINT OF BEAD BETWEEN ELECTRODES	________
20	F.	PENETRATION OF WELD	________
5	G.	TERMINATION OF WELD	________
5	H.	TIME	________
5	I.	NEATNESS	________
5	J.	CHIP AND POLISH	________

CUT-OFF TIME IS 25 MINUTES. DEDUCT ONE POINT FOR EACH MINUTE OR FRACTION THEREOF, OVER 20 MINUTES.

TOTAL SCORE ________

TRANSPARENCY IV-I-C

Form 7

MEAT IDENTIFICATION CARD

Class Name______________________________

Contestant Name______________________________

Class Number______________________________

Contestant Number______________________________

Select Species, Primal Cut, and Retail Name from the listings below and fill in the column blanks beside the cut number. The score column is for tabulators use only.

EXAMPLE: Beef round rump roast bnls

Species—1 point

1—Beef 2—Pork 3—Lamb

Primal Cuts—2 points

1. Brisket
2. Chuck
3. Flank
4. Foreshank and Breast
5. Ham
6. Leg
7. Loin
8. Plate
9. Rib
10. Round
11. Shank
12. Shoulder
13. Side (Belly)
14. Jowl
15. Variety Meats
16. Various**

Retail Trade Names—3 points

Roasts/Pot Roasts

1. American Style
2. Arm
3. Arm-Picnic
4. Back Ribs
5. Blade
6. Blade-Boston
7. Breast
8. Brisket (Whole)
9. Center Rib
10. Cross Cuts
11. Cross Rib
12. Foreshank
13. Fresh Side
14. Fresh Leg (Ham)
15. Frenched Style
16. Heel of Round
17. Loin
18. Mock Tender
19. Picnic (Whole)
20. Plate-Rolled (Bnls)*
21. Rib
22. Riblets
23. Roast-Large End
24. Rump
25. Rump (Bnls)
26. Rump Portion/Half
27. Shank Portion/Half
28. Short Ribs
29. Spare Ribs
30. Shoulder (Bnls)
31. Shoulder-Roll
32. Sirloin
33. Sirloin Half
34. Square Cut (Whole)
35. Tenderloin (Whole)
36. Tip
37. Tip-cap off

Steaks

38. Arm
39. Blade
40. Bottom Round
41. Center Slice
42. Eye
43. Flank
44. Porterhouse
45. Round
46. Sirloin
47. Sirloin (Bnls)
48. Smallend
49. T-Bone
50. Tenderloin
51. Top Loin (Bnls)
52. Top Round
53. Top Sirloin (Bnls)

Chops

54. Arm
55. Blade
56. Loin
57. Rib
58. Sirloin

Variety Meats

59. Brains
60. Heart
61. Kidney
62. Liver
63. Sweet Bread (Thymus)
64. Tongue

Processed Cuts
Non-Smoked

65. Beef for Stew
66. Fresh Ground Sausage
67. Corned Brisket (Bnls)
68. Ground Beef
69. Ground Lamb Patties

Smoked (or Cured) Pork

70. Rump Half
71. Shank Half
72. Center Slice
73. Loin Chops
74. Canadian Style Bacon
75. Picnic (Whole)
76. Shoulder Roll
77. Slab Bacon
78. Sliced Bacon
79. Jowl

Cut No.	Species	Primal	Retail Name	Score
00	1	10	25	
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

*(Bnls) = Boneless ** = From Various Primal Cuts

HANDOUT IV-I-A

BEEF CARCASS QUALITY GRADING CARD

Form 5

Class Name________________________________Class Number____________

Contestant Name____________________________Contestant Number__________

Car-cass No.	Prime			Choice			Good		Standard			Commercial*			Utility			Score
	High	Ave.	Low	High	Ave.	Low	High	Low	High	Ave.	Low	High	Ave.	Low	High	Ave.	Low	
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

TOTAL SCORE

Canner and Cutler grades will not be used in the contest.

*Since maturity is the factor between Standard and Commercial grades, carcasses will not be included in the contest which are close to borderlines of maturity between these grades. There is not a Commercial grade for the carcasses from young animals, therefore, the spaces given to "Commercial" are not considered when scoring the carcasses from young animals.

Contestant is to place a check mark in the grade subdivision in the proper space to the right of the carcass number. Ten points are allowed for the correct grading of each carcass. A deduction of one point will be made for a one third grade above or below the official grade, three points will be deducted for two-thirds grade above or below the official grade; six points will be deducted for one full grade above or below the official grade. The score will be zero for a grade more than one full grade above or below the official grade. Perfect score will be 100 points.

BEEF CARCASS YIELD GRADING CARD

Form 6

Class Name________________________________Class Number____________

Contestant Name____________________________Contestant Number__________

Car-cass No.	GRADE															Score
	No. 1			No. 2			No. 3			No. 4			No. 5			
	High	Avg.	Low	High	Avg.	Low	High	Avg.	Low	High	Avg.	Low	High	Avg.	Low	
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																

TOTAL SCORE

Contestant is to place a check mark in the grade subdivision in the proper space to the right of the carcass number. Ten points are allowed for the correct grading of each carcass. A deduction of one point will be made for a one third grade above or below the official grade, three points will be deducted for two-thirds grade above or below the official grade, six points will be deducted for one full grade above or below the official grade. The score will be zero for a grade more than one full grade above or below the official grade. Perfect score will be 100 points.

HANDOUT IV-I-B

DIVISION I
RANGE JUDGING SCORE CARD

Name or Number________________________ Score________

Chapter________________________

PART I

Score

A. Degree of Utilization

____ Unused

____ Light

____ Moderate or Proper

____ Close

____ Severe

____ Destructive

B. Kind of Range Site

____ Bottomland

____ Prairie

____ Medium Textured Upland

____ Deep Sand

____ Coastal Flatwoods

C. Range Condition Class

____ Excellent

____ Good

____ Fair

____ Poor

D. Name the Predominant

1. Decreaser________________________
2. Increaser________________________
3. Invader________________________

____ Score. Part I

Scoring—10 points for A.B.C.D. Part I
5 points for each correct answer under Part II

PART II

Score

A. Range Management Practices

____ 1. Defer grazing during growing season until decreaser grasses become dominant

____ 2. Defer grazing during growing season approximately 1 out of every 4 years

____ 3. Delay grazing in spring when range plants first come up

____ 4. Decrease rate of stocking

____ 5. Continue present grazing use and stocking rate

____ 6. Apply flexible stocking in order to limit use to 50 percent of year's growth

____ 7. Provide mineral supplement

____ 8. Protect from uncontrolled burning

____ 9. Apply brush control

____ 10. Graze undesirable annual grasses and forbs for short periods during growing season

____ 11. Practice light stocking following brush or weed control

____ 12. Defer grazing during growing season following brush control

____ 13. Recommend control burning

____ 14. Provide protein supplement food during the winter months

____ Score. Part II

HANDOUT IV-I-C

DIVISION II PLANT JUDGING SCORE CARD

				SEASON				MAJOR USE				GRAZING VALUE			WILDLIFE VALUE		
	Plant No.	Perennial	Annual	Cool	Warm	Native	Introduced	Improved Pasture	Native Pasture	Wildlife	Pests	Good	Fair	Poor	Good	Fair	Poor
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	
24																	
25																	

HANDOUT IV-I-D

GRASSES

1. Bahiagrass
2. Barnyardgrass
3. Bermudagrass
4. Broomsedge bluestem
5. Carpetgrass
6. Crabgrass
7. Dallisgrass
8. Giant cane
9. Indiangrass
10. Italian ryegrass
11. Johnsongrass
12. King ranch bluestem
13. Little barley
14. Marshhay cordgrass
15. Oats
16. Pearl millet
17. Pinehill bluestem
18. Purpletop
19. Rescuegrass
20. Seashore saltgrass
21. Smutgrass
22. Switchgrass
23. Tall fescue
24. Wheat
25. Yellow bristlegrass

LEGUMES

26. Alfalfa
27. Annual lespedeza
28. California burclover
29. Catclaw sensitivebriar
30. Crimson clover
31. Hop clover
32. Persian clover
33. Red clover
34. Showy partridgepea
35. Singletary peas
36. Sour clover
37. Sou. spotted burclover
38. Tephrosia sp.
39. Vetch
40. White clover

FORBES

41. Bitterweed
42. Canada thistle
43. Cocklebur
44. Dock
45. Grassleaf goldaster
46. Plantainleaf coneflower
47. Poor Joe
48. Ragweed, common
49. Shiny goldenrod
50. Swamp sunflower
51. Horsenettle
52. Wooly croton
53. Yankeeweed (cypressweed)

Scoring 4 points for name and 1 point for each characteristic

DIVISION III
PASTURE JUDGING SCORE CARD

PART I–SOIL FACTORS

Score

A. Natural Fertility
___ 1. Moderate to High
___ 2. Low

B. Surface Texture
___ 1. Coarse
___ 2. Medium
___ 3. Moderately fine
___ 4. Fine

C. Internal Drainage and Aeration
___ 1. Good–Moist subsoil dominantly reddish brown to yellowish brown–few or no gray mottlings
___ 2. Fair–Moist subsoil dominantly reddish brown to yellowish brown–considerable gray mottling
___ 3. Poor–Moist subsoil dominantly gray–usually some yellowish brown to red mottling

D. Permeability
___ 1. Rapid–coarse textured subsoil
___ 2. Moderate–medium textured subsoil
___ 3. Slow–moderately fine textured subsoil
___ 4. Very slow–fine textured subsoil

E. Slope
___ 1. No limitation–0-12%
___ 2. Moderate limitation–12-20%

F. Soil Reaction
___ 1. Acid
___ 2. Neutral or alkaline

G. Soil Suitability Groups For Pasture
___ 1. Group 1
___ 2. Group 2
___ 3. Group 3
___ 4. Group 4
___ 5. Group 5
___ 6. Group 6
___ 7. Group 7

______ Score. Part I

Allow 10 points for correct answers.

PART II–PASTURE JUDGING

Score

A. Mechanical Practices
___ 1. Slope gullies
___ 2. Level out terraces
___ 3. Provide water for livestock
___ 4. Brush control, spray
___ 5. Brush control, mechanical
___ 6. Fence
___ 7. Install drainage system

B. Kind of Plants
___ 1. Bahiagrass
___ 2. Bermudagrass
___ 3. Tall fescue
___ 4. Crimson clover
___ 5. White clover
___ 6. Singletary peas and/or vetch
___ 7. Winter annual grasses (Ryegrass or small grain)
___ 8. Summer annual grass (Millet or sorghum–sudan hybrid)

C. Fertilization, seedbed preparation and planting method
___ 1. Apply lime broadcast
___ 2. Apply nitrogen
___ 3. Apply phosphorus
___ 4. Apply potassium
___ 5. Plant on clean, well prepared seedbed
___ 6. Broadcast legume seed on established grass sod
___ 7. Manage present vegetative cover
___ 8. Inoculate legume seed

D. Management
___ 1. Mow or spray for weed control
___ 2. Graze for proper use of grass
___ 3. Rotation grazing
___ 4. Exclude grazing for winter annual legume to seed
___ 5. Graze summer perennial grass close in fall
___ 6. Defer grazing during summer (June-Sept.)

______ Score. Part II

Allow 5 points for each correct answer. Reduce each section score 5 points for each incorrect answer in that section. (A.B.C.&D.). Do not reduce a section score below 0.

CONTESTANT NAME ______________________ CONTESTANT NUMBER ____

SCHOOL ______________________

SCORE SHEET
TREE IDENTIFICATION

No.	4 Points Common Name	2 Points Botanical Name	2 Points Characteristics	
			Deciduous	Evergreen

CONTESTANT SCORE ____

HANDOUT IV-I-G

CONTESTANT NAME ______________________________

CONTESTANT NO. ______________________________

SCHOOL ______________________________

SCORE SHEET
TIMBERSTAND IMPROVEMENT (T.S.I.) AND/OR THINNING

(Circle One Choice)

TREE NO.				TREE NO.			
1.	CUT	LEAVE	DEADEN	16.	CUT	LEAVE	DEADEN
2.	CUT	LEAVE	DEADEN	17.	CUT	LEAVE	DEADEN
3.	CUT	LEAVE	DEADEN	18.	CUT	LEAVE	DEADEN
4.	CUT	LEAVE	DEADEN	19.	CUT	LEAVE	DEADEN
5.	CUT	LEAVE	DEADEN	20.	CUT	LEAVE	DEADEN
6.	CUT	LEAVE	DEADEN	21.	CUT	LEAVE	DEADEN
7.	CUT	LEAVE	DEADEN	22.	CUT	LEAVE	DEADEN
8.	CUT	LEAVE	DEADEN	23.	CUT	LEAVE	DEADEN
9.	CUT	LEAVE	DEADEN	24.	CUT	LEAVE	DEADEN
10.	CUT	LEAVE	DEADEN	25.	CUT	LEAVE	DEADEN
11.	CUT	LEAVE	DEADEN	26.	CUT	LEAVE	DEADEN
12.	CUT	LEAVE	DEADEN	27.	CUT	LEAVE	DEADEN
13.	CUT	LEAVE	DEADEN	28.	CUT	LEAVE	DEADEN
14.	CUT	LEAVE	DEADEN	29.	CUT	LEAVE	DEADEN
15.	CUT	LEAVE	DEADEN	30.	CUT	LEAVE	DEADEN

TWO POINTS FOR EACH CORRECT ANSWER

CONTESTANT SCORE ____________

HANDOUT IV-I-H

CONTESTANT NAME ______________________ CONTESTANT NO. ________

SCHOOL ______________________

Sawlog Score Sheet

TREE NO. No.	D.B.H.	#16 ft. Logs	Board Feet	Value

Total Volume in Board Feet Per Acre ________

Total Value Per Acre ________

CONTESTANT SCORE ________

CONTESTANT NAME ______________________ CONTESTANT NO. __________

SCHOOL ______________________

Pulpwood Score Sheet

TREE NO.	D.B.H.	HT.	VOL.	

Total Volume in Cubic Feet Per Acre __________

Cords Per Acre __________

Total Value Per Acre ____

Contestant Score ________

MILK QUALITY AND DAIRY FOODS CONTEST

Form 3

Contestant Name ______________________ **Contestant No.** __________

Write scores only on the line marked for contestant's score. Mark (X) in space opposite the defect noted and in proper sample column. Do NOT write in space indicating official score, grade, difference, grade on defects, rubber parts and metal parts.

		SAMPLE NUMBER										TOTAL GRADES
	DEFECTS	1	2	3	4	5	6	7	8	9	10	
	Contestant's score											
MILK FLAVOR	Official score											
	Grade difference											
	Grade on defects											
	Bitter											
No Defect 10 Points	Feed											
	Flat-watery											
Range 1-10	Foreign											
(Defects valued at 2 points each)	Garlic or Onion											
	High Acid											
	Malty											
	Metallic/Oxidized											
	Rancid											
	Salty											
	Unclean											
	No defect											
	Contestant's score											
MILK SEDIMENT 8 Points	Official score											
	Grade difference											
	Varieties	1	2	3	4	5	6	7	8	9	10	
IDENTIFICATION OF CHEESES	Grade on Identification*											
(Incorrect Identification 2 Points each)	1. Blue											
	2. Brick											
	3. Brie/Camembert											
	4. Cheddar (mild)											
	5. Cheddar (sharp)											
	6. Colby											
	7. Cream/Neufchatel											
	8. Edam/Gouda											
	9. Monterey (Jack)											
	10. Mozzarella/Pizza											
	11. Muenster											
	12. Processed American											
	13. Provolone											
	14. Swiss											

TEST SCORE Test on Milk production (Number wrong)

CONTESTANT'S SCORE — PART I

*Refer to Bulletin 4 for examples of scoring.

MILK QUALITY AND DAIRY FOODS CONTEST

Form 4

Contestant Name **Contestant No.**

Write scores only on the line marked for contestant's score. Mark (X) in space opposite the defect noted and in proper sample column. Do NOT write in space indicating official score, grade difference, grade on defects, rubber parts and metal parts.

		SAMPLE NUMBER										TOTAL GRADES
	DEFECTS	1	2	3	4	5	6	7	8	9	10	
	Contestant's score											
Cottage Cheese Flavor and Odor	Official score											
	Grade difference											
No Defect 10 Points	Grade on defects											
	Acid											
Range 1-10	Bitter											
(Defects valued at 2 points each)	Coarse											
	Fermented/Fruity											
	Flat											
	Foreign											
	Lacks Freshness											
	Malty											
	Metallic/Oxidized											
	Yeasty											
	Rancid											
	Salty											
	Unclean											
	No defect											

	Contestant's score											
	Official score											
MILKER UNIT	Grade difference											
	Grade on defects											
No Defects 4 Points	Rubber parts/Plastic											
	dirty or milkstone											
(Defects valued at 0.5 points each)	checked or blistered											
	leaky											
	poorly fitted											
	Metal parts/Rigid Plastic											
	dirty or milkstone											
	badly dented or damaged											
	pitted or corroded											
	open seams											

TEST SCORE Test on milk marketing (Number wrong)	
CONTESTANT'S SCORE — PART II	

*Refer to Bulletin 4 for examples of scoring.

FORM 14

NURSERY/LANDSCAPE IDENTIFICATION

CONTESTANT NAME______________________________ CONTESTANT NO.__________

This list conforms to HORTUS THIRD, the internationally accepted authority for nomenclature. (x means hybrid; cv. means cultivar.)

NO.	COMMON NAME/BOTANICAL NAME
____	Glossy Abelia/Abelia x grandiflora
____	Red Maple/Acer rubrum
____	Silktree (Mimosa)/Albizia Julibrissin
____	Norfolk Island Pine/Araucaria heterophylla
____	Japanese Aucuba/Aucuba japonica
____	Brazil Bougainvillea/Bougainvillea spectabilis
____	Schefflera (Octopus Tree)/Brassaia actinophylla
____	Common Box/Buxus sempervirens
____	Common Camellia/Camellia japonica
____	Redbud/Cercis canadensis
____	Japanese (Flowering) Quince/Chaenomeles speciosa
____	Flowering Dogwood/Cornus florida
____	Italian Cypress/Cupressus sempervirens
____	Spotted Dumb Cane/Dieffenbachia maculata cv.
____	Warneckii Dracaena/Dracaena deremensis "Warneckii"
____	Corn Plant Dracaena/Dracaena fragrans "Massangeana"
____	Japanese Fatsia/Fatsia japonica
____	Decora Rubber Plant/Ficus elastica "Decora"
____	Common Gardenia, Cape Jasmine/Gardenia jasminoides
____	Ginkgo, Maidenhair Tree/Ginkgo biloba
____	English Ivy/Hedera Helix
____	Chinese Holly/Ilex cornuta cv.
____	Japanese Holly/Ilex crenata cv.
____	Dwarf Pfitzer Juniper/Juniperus chinensis "Pfitzeriana"
____	Crape Myrtle/Lagerstroemia indica cv.
____	Amur Privet/Ligustrum amurense
____	Japanese Privet/Ligustrum japonicum cv.
____	Sweet Gum/Liguidambar Styraciflua
____	Tuliptree/Liriodendron Tulipifera
____	Hall's Japanese Honeysuckle/Lonicera japonica "Halliana"
____	Bullbay (Southern) Magnolia/Magnolia grandiflora
____	Chinese (Saucer) Magnolia/Magnolia x Soulangeana
____	Flowering Crabapple/Malus species and cv.
____	Heavenly Bamboo/Nandina domestica
____	Common Oleander/Nerium Oleander
____	Sour Gum (Black Gum)/Nyssa sylvatica
____	Japanese Photinia/Photinia glabra
____	Southern Yew/Podocarpus macrophyllus
____	Thundercloud Flowering Plum/Prunus cerasifera "Thundercloud"
____	Firethorn/Pyracantha coccinea
____	Bradford Pear/Pyrus Calleryana "Bradford"
____	Live Oak/Quercus virginiana
____	Hybrid Tea Rose(cultivars)/Rosa x cv.
____	Cabbage Palmetto/Sabal Palmetto
____	Bridal-Wreath/Spirea prunifolia
____	American Arborvitae/Thuja occidentalis cv.
____	Star Jasmine (Confederate Jasmine)/Trachelospermum jasminoides
____	Chinese Wisteria/Wisteria sinensis

National Public Speaking Contest *Judges' Score Sheet*

PART I. FOR SCORING CONTENT AND COMPOSITION

Items To Be Scored	Points Allowed	Points Awarded Contestant												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Content of Manuscript	200													
Composition of Manuscript	100													
Score on Written Production	300													

PART II. FOR SCORING DELIVERY OF THE PRODUCTION

Items To Be Scored	Points Allowed	Points Awarded Contestant												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Voice	100													
Stage Presence	100													
Power of Expression	200													
Response to Questions	200													
General Effect	100													
Score on Delivery	700													

PART III. FOR COMPUTING THE RESULTS OF THE CONTEST

Items To Be Scored	Points Allowed	Points Awarded Contestant												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Score on Written Production	300													
Score on Delivery	700													
TOTALS	1000													
*Less Overtime Deductions, for each minute or major fraction thereof	20													
*Less Undertime Deductions, for each minute or major fraction thereof	20													
GRAND TOTALS														
Numerical or Final Placing of Contestants														

*From the Timekeeper's record.

HANDOUT IV-I-N

Judge's Score Sheet

Extemporaneous Speaking Contest

		Order of Speaking							
	Names or Code No. of Contestants								
	Points Allowed	Points Awarded Contestants							
Content Related to Topic	100								
Knowledge of Subject	100								
Organization of Material	100								
Power of Expression	200								
Voice	100								
Stage Presence	100								
General Effect	100								
Response to Questions	200								
TOTAL POINTS (Gross)	1000								
Less Time Deductions	1 pt./sec								
Total Points (Net)									
Rank of Contestant									

HANDOUT IV-I-O

INSTRUCTIONAL AREA: Agriculture Leadership

INSTRUCTIONAL UNIT IV: Participation in FFA Activities

LESSON 2: Fairs, Shows, and Sales

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Attend and participate in as many fairs, shows, and/or sales as is practical or relevant to the student's SOEP.

2. Specific:

a. Fit and show animals to their best advantage.
b. Exhibit crops and other projects according to the rules and guidelines.
c. Show sportsmanlike behavior at all times.
d.
e.
f.

Note: The format of this lesson is somewhat different from that of previous lessons. The purpose of this lesson is to provide hints to help teachers better prepare students for participation in FFA contests, awards, and activities.

B. Review Teaching Materials

1. "Your 4-H Dairy Calf," Pub 1371 Louisiana Cooperative Extension Service

2. "Market Hog Project Manual," Pub 1804 Louisiana Cooperative Extension Service

3. "Fit and Show Your 4-H Beef Calf," Pub 1256. Louisiana Cooperative Extension Service

4. "Feeding and Caring for Your Lamb," Pub 1716, Louisiana Cooperative Extension Service

5. Livestock show catalogs

6. Louisiana State Fair catalog

7. Parish Fair catalog

8. Breed association rulebooks

9. "Rabbit Project I and II," Cooperative Extension Service, Ohio State University; Columbus, Ohio 43210.

10. "Conditioning Standard Bred Poultry and Bantams for the Show Room," William O. Cawley, Cooperative Extension Service, Texas A&M University, College Station, Texas.

11. "How to Produce Broilers for Show," W. O. Cawley, Publication S5.141, Texas Agriculture Extension Service, Texas A&M University, College Station, Texas.

12. Ensminger, M.E. Stockman's Handbook. 5th Edition. Danville, Ill.: Interstate Publishers, 1978.

C. Special Arrangements

1. Slides and/or pictures of previous fairs, shows, and/or sales. Slide projector

2. Transportation for animals and students to the fair, show, or sale location.

3. Grooming and showing equipment

II. Presentation of Lesson

A. Motivation

1. All greenhands will attend the parish fair and assist with exhibits.

2. Show slides and/or pictures of awards won at previous fairs and shows.

B. Content Outline

1. General Fair/Show Guidelines for Livestock Exhibits

    a. Possession dates -- For each fair/show there are certain dates by which animals must be in the possession and care of the FFA member. Consult specific premium list catalogs and/or Cooperative Extension Agents for this infomation.

    b. Classes -- Each fair/show offers different classes for livestock and other exhibits. Refer to premium catalogs for the specific event.

    c. Show weights -- There are weight cut off points for many species of livestock. Each show is different in this aspect. Check premium catalog and/or the Cooperative Extension Agent for this information.

    d. Exhibitor requirements

        1) Must be a bonafide FFA member and meet age requirements of the specific fair/show.

        2) Other requirements are specified by each fair/show committee. Read premium catalogs for specific rules.

    e. Before entering and/or exhibiting at a fair/show be sure to read thoroughly the specific premium catalog for all entry deadlines, rules, classes offered, awards presented, class schedules, and other valuable information.

    f. Make entries clearly and include all information requested. (Registration papers or copies maybe required by the entry deadline.)

    g. Make arrangement for safe, comfortable animal transportation.

        1) Don't overcrowd.

        2) Provide good footing.

3) If long distance hauling, stop and provide water at regular intervals.

4) Watch for chilling or overheating.

5) Do not transport sick animals with others.

6) Separate animals by class: swine from beef, beef from sheep, etc., in the truck or trailer.

7) Put poultry into separate cages to prevent bruises and broken wings.

8) Do not drive too fast, especially around corners.

h. Upon arrival at the show/fair check in at the appropriate office(s) before unloading.

i. Have animals weighed upon arrival or according to the published schedule.

j. Exhibitors should provide for their animal:

1) Feed container.

2) Water container.

3) Feed (grain, hay, etc.)

4) Grooming equipment.

5) Barn halter, show halter, saddle and bridle if applicable.

6) Show stick or cane.

7) Show box (big enough to hold necessities but not so large that it can't be moved).

8) Blanket.

9) Shovel, pitchfork, rake, and broom.

k. Feed animals on a regular schedule during the show. Do not overfeed or feed a different kind of feed from what is regularly fed.

l. Provide plenty of water. It is needed for normal digestion and body function.

m. Keep the exhibit area clean

   1) Dispose of manure as quickly as possible.

   2) Rake the bed area.

   3) Sweep the aisleway and sprinkle with water to keep down the dust.

   4) Decorate the area with banners, flags, etc. (Don't overdo it.)

   5) Groom your animals even if they are not being shown. Many people will see your exhibit during the week.

n. Make a personal schedule for your week at the fair/show. Include all times that you, the exhibitor, must be at a certain place.

   1) Weigh-in

   2) Feeding times

   3) Show times

   4) Sale times

   Post the schedule on the inside lid of your show box or other conspicuous place.

o. Be on time for all activities. This is the sign of a good show person.

p. Prepare the animal for the class and then prepare yourself.

   1) Wear neat, clean, correctly fitting clothes.

   2) Keep your hair neatly trimmed or in braids. Do not let hair hang loose!!

   3) Do not wear a hat that does not fit the occasion. If it detracts from

a neat, professional appearance, don't wear it!

4) If showing a dairy animal, wear a white shirt and pants.

5) Wear boots if appropriate (not necessary in showing poultry or rabbits).

6) When showing horses, you must follow strict rules for attire. Follow the rules for the style of riding that you are showing (i.e. Western, Saddle Seat, Hunt Seat).

7) Wear make-up if you wish but be careful not to overdo it.

8) Make sure fingernails are clipped short and clean or polished.

9) Do not use snuff, chewing tobacco, or gum at showtime!

q. Listen to announcements so that you know when your class is coming up.

r. Be at the make-up area or paddock on time to check in.

s. Enter the arena and follow instructions of the announcer, ringmaster, and/or judge.

t. Pay attention to your animal and to the judge. Don't forget either of them.

u. Be a good sport about winning or not winning.

v. Reward your animal by quiet talking and patting.

w. Make sure that show equipment (halters etc.) are clean and in good repair.

x. Do not take livestock from the fair/ show until permitted.

y. Provide for safe travel home if the animal is not sold.

z. Care for your animal until sold or trucked to the packing plant. This depends on the fair/show regulations.

2. Exhibits other than livestock: At the Louisiana State Fair and some parish fairs, premiums are awarded for crop and other exhibits.

   a. Locate fairs where your exhibit will be welcomed. Write for premium catalogs or call the Cooperative Extension office for this information.

   b. Read the regulations for your type of exhibit (i.e. Weed Identification Display). Prepare exhibit or display accordingly.

   c. Obtain entry blanks and/or cards from the fair office. Complete the entries and submit them by the deadline.

   d. Deliver display to the fair on time, and check it in at the appropriate office.

   e. Pick up the display at the correct time. Exhibits not picked up are usually given away or destroyed.

   f. Louisiana State Fair offers premiums in

      1) Weed Identification

      2) Seed Identification

      3) Cotton

      4) Sugar Cane

      5) Rice

      6) Hybrid Corn

      7) Sweet Potatoes

      8) Irish Potatoes

      9) Forestry

      10) Insects

      11) Arts and Crafts

      12) Photography

3. Fitting and Show Grooming

a. General Suggestions

1) After taking possession of the show animal, feed a balanced growth or maintenance ration. Follow recommended practices for raising a healthy animal that is growing at the proper rate.

2) Begin gentling the animal. Get it used to being worked around and having people come up to it and touching it.

b. Beef Cattle

1) Train the calf to tie (always use a strong well-fitting halter).

2) Train the calf to lead once he is used to the halter and being tied.

    a) Begin this training as soon as possible after acquiring the calf, and

    b) Begin leading in a small area so that the calf cannot get away. Gradually work your way to larger open areas.

3) Work with the calf to always stand squarely with his back level for periods of 15 minutes.

4) Lead from the left or near side with your right hand about 12" from the head. Pull straight up on the lead, training the animal to respond quickly to your cues. (Work with the calf 15 minutes a day, seven days a week.)

5) Use your show stick to help place the feet and to level the animal's back by gently scratching its belly.

6) Bathe the calf with warm water and a mild soap once a month up to the last six weeks, then bathe once a week.

  - a) Wet animal thoroughly,
  - b) Apply soap and work in with a stiff brush using extra water to loosen dandruff and work up a lather, and
  - c) Rinse thoroughly, scrape off excess water and rinse again. (You may want to lather up again.)

7) Have the calf's hooves trimmed at regular intervals so that it will stand correctly and comfortably.

8) Train and polish horns if applicable.

9) Brush the calf daily with a stiff brush to loosen dandruff and bring out the natural oils.

10) Train the hair to stand opposite the direction that it grows by brushing up with a scotch comb until dry. About five days before showing trim or clip the animal:

  - a) Clip the head of all polled and dehorned animals (do not clip any ears or polls of polled Herefords). You may want to clip the head earlier.
  - b) Clip the tail head to remove roughness and to level the topline,
  - c) Clip the tail upward from just where the twist begins, and
  - d) Clip the brisket, belly, body, and legs to emphasize the animal's strong conformation points.

11) Show day preparations include:

  - a) Early morning rinse (lightwash) and thorough drying,

b) Blow or brush all dust and dirt from animal,

c) About 45-60 minutes before show time, bone up the legs with glycerin, saddle soap, and a scotch comb.

d) Use saddle soap or butch wax to make tail head and poll hair stand up.

e) Apply butch wax to side and topline to help hold hair in place.

(1) Pat wax on with hand,

(2) Rub in with circular motion, and

(3) Pull hair up with Scotch comb.

f) Rat the switch and tie into a ball. Spray with adhesive to hold ball (not for Brahman or Santa Gertrudis).

g) Apply a light coat of show oil.

h) For summer shows the sides and neck are brushed down. Only legs, tail head, and poll are pulled up.

c. Dairy Cattle

1) Dehorn calves with

a) Caustic paste at one to two weeks of age, or

b) Electric dehorner at one month of age.

2) Remove extra teats at one-two months of age if necessary.

3) Bathe as for beef cattle (use bluing to whiten white hair).

4) Blanket animal six to eight weeks before the show. Keep blanketed except during grooming.

5) Groom each day, first with a stiff brush (not a curry comb) and then with a soft brush.

6) You may wish to massage in a light oil/alcohol mixture after brushing.

7) Train calf to tie, lead readily, and stop promptly. Work with the calf 10-15 minutes each day.

8) Condition heifers to stand with the hind leg nearest the judge slightly in front. Reverse this for cows in milk. Work with your animal and train her to stand squarely with her head up and back straight.

9) Trim and rasp hooves at regular intervals.

10) Train and polish horns if necessary.

11) One to two days before the show:

    a) Clip the head including the inside and outside of the ears,

    b) Clip the tail from just above the switch to the tail head, being sure to blend in the area to that not clipped,

    c) Clip the underline, belly, and udder of cows, and

    d) Clip off any long or out of place hairs.

12) The day before the show

a) Wash and dry the animal.

b) Rub in a mixture of one to one mineral oil/alcohol.

c) Clean out ears carefully.

d) Clean hooves and horns.

e) Wash the switch well, use bluing and braid it while still wet.

f) Add a little extra salt to the ration so she will drink more water the next day.

g) Use plenty of fresh bedding.

13) On show day

a) Sponge off any soiled areas.

b) Comb and brush out the switch.

c) Brush with a soft brush.

d) Polish hooves and horns.

e) Apply a very light oil with a cloth or use a commercial spray.

f) Rub with hands to bring out natural oils and lay down the hair.

d. Swine

1) Train the animal to stand and to be guided with a cane or whip (not both) placed on either side of the head.

Begin training at least six weeks before show time.

2) Trim feet so the animal will stand squarely.

a) Trimming is best done while the animal is lying on its side.

b) Do not trim within two weeks of the show.

3) Wash the animal with warm soapy water:

a) Start this about one month before showing, and

b) Wash at least once per week so the animal gets used to it.

4) Groom the hair coat with an expanded ceramic sanding block to remove the long hair and give a more youthful appearance. Use care to remove only the longest hair.

5) Oil the skin to soften it and train the hair to lie flat.

6) White hogs may look better if powdered lightly with talcum powder.

Note: Check show regulations as some shows allow nothing more than washing hogs as preparation at the showground.

7) On show day -- keep the hog standing once you have washed it for the show.

e. Sheep

1) Train the sheep to stand while being handled:

a) Set the animal squarely on all four feet, and

b) Always keep a hand on the head while setting the lamb up.

2) Trim the feet at least two weeks ahead of showtime so they stand correctly.

Use a sharp pocket knife after setting the sheep on its dock.

3) Special equipment needs:

   a) Sturdy trimming table,

   b) Sheep shears with extra blades,

   c) Hand shears,

   d) Wool card No. 2 or 3,

   e) Rice root brush,

   f) Sheep blanket,

   g) Bucket,

   h) Nylon web halter,

   i) Rope halter,

   j) Curry comb, and

   k) Small electric animal clippers.

4) Market Lambs

   a) Shear five to seven days before the show.

   b) Leave "boots" on front and rear legs to give illusion of bone thickness.

   c) Clip head and ears with animal clippers about a week before showing.

   d) Wash the sheep once or twice before showing with mild soap. Be sure to blanket to prevent chilling. A blow dryer helps dry them quickly if available.

e) Use hand shears to get out clipper marks before showtime.

5) Breeding Sheep

a) Shear four to six weeks before showing.

b) Trim fleece to about 3/4 to one inch a few days before the show.

c) Block lamb three to five days before the show.

(1) Smoothly blend body lines after leaving straight topline and a smooth underline.

(2) Work the wool with the card to fluff it to full length.

(3) Shear belly clean and blend it into the sides.

(4) Card out wool on legs, trimming off any ragged locks.

d) Cover with blanket to protect your work until showtime.

f. Horses

1) Provide basic training

There are many different ways in which to train a horse. Although the approach may differ, most good trainers schedule the schooling of the horse as follows:

a) Training the foal -- Put a halter on the foal when it is 10 to 14 days old. Teach it to lead and stand properly.

b) Training the yearling -- Teach the yearling the meaning of "whoa," his name, and to get used to the blanket and saddle.

c) Training at 18 months old -- At 18 months of age, teach the young horse to drive, turn, stop, and back up by using driving; to flex his neck and set his head; and to respond to the bosal.

d) Training the two-year-old -- Train the two-year-old to respond to the aids (legs, hands and reins, and voice); to back; and if a western horse, train him to pivot and to make a sliding stop.

Remember training is an on-going process.

2) Groom daily

To assure that the horse will be groomed thoroughly and that no body parts will be missed, follow a definite order. This may differ according to individual preference, but the following procedure is most common:

a) Clean out the feet,

b) Groom the body,

c) Brush the head, comb and brush the mane and tail,

d) Wipe with the grooming cloth,

e) Check the grooming, and

f) Wash and disinfect grooming equipment.

3) Keep horses clipped according to breed customs and regulations. Remove long hair from around jaw, face, ears (put cotton in ears to keep hair out while clipping), and fetlocks.

4) When it is necessary to bathe the horse such as after excessive sweating or before showing follow these guidelines:

    a) Wet entire animal (cover ears to keep water out),

    b) Use a sponge with soapy water to wash the horse. Use a rubber curry comb to loosen dandruff and dead hair,

    c) Rinse THOROUGHLY,

    d) Scrape off excess water and walk until dry or tie in a draft free area,

    e) Blanket the horse,

    f) Clean ears, and

    g) Clean hooves to be polished later.

5) On show day

    a) Groom horse thoroughly.

    b) Rub with a grooming cloth or towel to bring out oils and lay down hair.

    c) Apply a coat dressing (spray or cloth). (Experiment at home with this so that it isn't too heavy.)

    d) Apply baby oil around eyes, muzzle, and a light coat inside the ear. (If the horse is not well groomed before this is done, the oil will not give a finished appearance.)

e) Halter or saddle and bridle the animal.

g. Poultry

1) Remove heat from brooder at four to five weeks (when birds are fully feathered).

2) Keep artificial and/or natural light on birds 24 hours per day (40 watt bulb 6 feet above birds).

3) Keep animals at 55-75° and well ventilated.

4) Select birds from the flock three weeks prior to the show.

   a) Treat these for lice.

   b) Put in a smaller house with runs and some green feed.

5) Begin coop training a week before the show

   a) Place the bird, head first, into a coop similar to ones used at poultry shows.

   b) Remove bird by

      (1) Opening door quietly.
      (2) Manuever bird so that it faces to the right or left.
      (3) Reach in, across the back, and firmly grasp the distant wing at the shoulder.
      (4) Keep the wing folded and close to the bird's body.
      (5) Rotate bird toward the door.
      (6) Slide the free hand under the breast while grasping the right and left legs just above the hock. The keel bone should rest on the palm of the hand.
      (7) Lift the bird from the coop floor.

- (8) Bring the bird out of the coop head first.
- (9) Release the wing.
- (10) Examine the bird while opening its wings.
- (11) Follow this procedure two to three times per day so that the animals will show their natural condition to greater advantage.

6) The day prior to showing

- a) Wash feet and legs in warm soapy water.
- b) Wash the bird in warm water and mild detergent.
    - (1) Suds the birds by rubbing with the feathers.
    - (2) Rinse two or three times with clean warm water.
- c) Dry the bird with a towel and place in a grooming sleeve.
- d) If the bird has a crest, hold the bird upside down and submerge the crest feathers. Work suds into the top knot until well lathered. Rinse well.
- e) Pull out any feathers that are too long or broken.
- f) Clean the comb, wattles, and around the nostrils.
- g) Dry crest and head with a dryer on warm (not hot).
- h) Apply a little petroleum jelly to shanks, feet, combs, and wattles. Don't allow any jelly to get on the feathers.
- i) Place on four inches of clean, dry litter with a heat lamp or large bulb 3 to 4 feet above the birds. Keep area at about 90° to dry bird.

h. Rabbits

1) Keep hutch clean and well bedded.

2) Keep rabbit away from direct sunlight.

3) Check daily for signs of ear canker.

4) Begin grooming as soon as you have selected the animals to be shown.

   a) Wet hands and rub hair back and forth vigorously but gently to loosen hair and induce molt.

   b) After moistening hair as above stroke animal from head to tail (leave ears upright) until the hair is dry.

5) After three to seven days only moisten hands slightly and stroke from head to tail.

6) Hold ears upright and together gently with two fingers for a short while each day.

7) Pose animals properly (to display their good points) while grooming.

8) Stand back a few moments at a time while the rabbit remains posed.

9) If white hair is stained, a gentle bleach like peroxide may be used near showtime. A small amount of talc may also be used.

10) Follow your daily grooming routine on show day.

4. Care of livestock during the fair/show --

a. Feeding

1) Feed the same feed stuff that was used at home.

2) Modify the amount fed according to the condition of the animal (do not overfeed).

3) Make sure animals get plenty of water, especially during warm weather.

b. Bedding

1) Keep animals bedded well to keep them clean and prevent sores from concrete or other hard surfaces.

2) Be sure to remove manure frequently; the livestock area receives many visitors.

c. Observe your animals frequently for changes in behavior. Any changes in eating habits or other characteristics may indicate sickness or some other problem with the environment.

d. Exercise: If the show provides a time and place for exercise of livestock, take advantage of it. Always be careful when taking animals in an area with others that they are not used to.

5. Showing and showmanship

a. General: An exhibitor should be prompt, alert, and dressed appropriately and neatly. If pre-show grooming, fitting, and training have been done, the showing of the animal will display this fact.

1) Have animal and self perfectly groomed.

2) Be on time.

3) Watch classes before yours to be familiar with the procedure. This is the best way to learn about showing.

4) Show good sportsmanship at all times.

b. Beef Cattle

1) Have with you in the ring:

a) Exhibitor number for the correct animal,

b) Show stick, and

c) Scotch comb.

2) Lead from the left side, walking near the left shoulder, with the lead strap neatly coiled in the right hand.

3) When lining up leave 3 to 4 feet between animals.

4) After you stop the calf, switch show stick to right hand, lead strap to left hand, and set animal up.

5) Stand animal squarely with front feet slightly higher than rear feet if possible.

6) Stroke calf's underside with show stick to keep it calm and to level the top line.

7) When instructed to change position in the ring, follow these rules:

   a) Move smoothly to the new position.

   b) Do not cross between the judge's eye and the other animals.

   c) Walk behind the judge if he/she is close to the class.

   d) When turning the calf, turn around the calf; do not let the calf turn around you.

   e) Use common sense and courtesy to help choose your path to the new position.

8) If the judge handles the calf, comb the hair back into place.

9) As the judge moves around your calf, take sideways half-steps around the near side of your animal to give the judge the best view.

Make sure that you can always see all four feet of your calf.

10) Accept awards and leave the ring as directed by the ringperson and announcer.

11) Wash animal thoroughly after showing is completed that day.

c. Dairy Cattle

1) Have with you in the showring the correct exhibitor number.

2) Walk the animal in a clockwise direction slowly, one-half step at a time.

3) Always keep the animal between you and the judge.

4) One hand should hold the coiled lead strap, and the other should grasp the halter on the rear side of the head for control.

5) Be able to walk forward or backward with your animal under control at all times.

6) Stand heifers with front feet parallel and the hind foot nearest the judge one-half step back.

7) Stand cows with front feet parallel and the hind foot nearest the judge one-half step forward.

8) Attempt to stand animals with front feet slightly higher than the rear feet.

9) Do all positioning with halter commands. (Do this training at home.)

10) When called into line, move quickly and smoothly. Be courteous and use common sense to get the animal into position.

11) Follow ringperson's and announcer's directions for receiving awards and leaving the showring.

d. Swine

1) Have with you in the ring:

   a) Correct exhibitor number, and

   b) Cane or whip (to guide the hog).

2) Keep your hog in the judges view at all times. Do not crowd the judge.

3) Stay 15 to 20 feet from judge.

4) Keep in the open.

5) Make sure your hog does not fight with or bite other hogs.

6) Keep the animal alert and moving at all times.

7) Follow directions of ringmaster and announcer for accepting awards and exiting the ring.

e. Sheep

1) Be sure to wear the correct exhibitor number in the showring.

2) After entering the ring, walk the lamb with the left hand under the chin and the right guiding with the dock.

3) When directed to set up, choose a favorable position.

4) Stand the animal squarely with the head up and the back well supported.

5) Place yourself (standing or squatting) to the left or front of the animal.

6) Lightly grasp wool under the chin with the left hand.

7) Keep the right hand free to keep the sheep set up properly.

8) Push with knee against the lamb's breast while the judge handles it.

9) As the judge moves, be sure to move and always allow him a good view of the animal.

10) When changing positions, do so from behind the line.

11) Follow directions for receiving awards and leaving the showring.

f. Horses

1) Enter the ring with the correct exhibitor number.

2) Lead your horse from the left, keeping even with the horses' throatlatch area.

3) Hold the right hand 10-12 inches from the halter, with the left hand holding the remainder of the lead strap in a coil near the left hip.

4) Circle the ring counter clockwise until directed to line up. Do not pass other horses, crowd them, or lag behind. A brisk, alert walk is suggested.

5) When lining up keep plenty of room between animals, so the judge may walk around and for safety in the ring.

6) Set the horse up squarely or according to breed customs and/or guidelines.

7) Follow directions from the ringmaster for individual tracking (at the walk and trot) of your horse.

8) If asked to change position in line, either back out of line or turn the horse 180° and leave the

line, returning to the line from behind.

9) While posing the animal, never stand in the judge's view of the animal.

   (a) As the judge moves around the animal, quickly and smoothly move in a semicircle around the front of the horse. Spend as little time as possible on the far or right side of the horse.

   (b) Make sure that you can see the judge and all four feet of the animal.

10) Practice at home so the horse will:

   (a) Walk and trot out readily,

   (b) Stop quickly and straight,

   (c) Set up quickly, and

   (d) Remain set up without fidgeting.

11) Follow instructions for receiving awards and leaving the ring.

g. Poultry

All the showmanship is done before showtime. It includes:

1) Selecting,

2) Housing,

3) Feeding,

4) Training, and

5) Grooming.

h. Rabbits

All the showmanship is done before showtime. It includes:

1) Breeding,

2) Selecting,

3) Housing,

4) Feeding,

5) Training, and

6) Grooming.

6. Sale time

a. Rules for each sale will vary. Be familiar with these points:

1) Will all animals shown be sold?

2) Is there a commission charge?

3) When is the sale?

4) What is the sale order?

5) Who cares for the animal after the sale?

6) Does the exhibitor have to be there to get the animal to the sale ring?

7) When is the weighing for the sale?

8) When does the seller receive the money for his/her animal?

9) Will there be buyers for animals not sold in the sale ring?

10) Do animals have to be moved to a different location prior to the sale?

b. Prior to making a decision to exhibit at a livestock show that is accompanied by a sale, carefully read the rules in the Premium Catalog. If you still have questions, call the sale manager for more information. It is the owner's responsibility to know all rules and follow them.

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT I: Soil Formation

LESSON 1: Definition of Soil

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Explain how to profile soils and differentiate the surface soil from the subsoil.

2. Specific:

a. Define soil.
b. Distinguish between surface soil and subsoil.
c. Identify the six main soil areas in Louisiana and their uses.
d. Describe a soil profile.
e. Identify the various soil horizons in a soil profile.
f.

g.

h.

B. Review Teaching Material

1. Donahue, Roy L., Roy H. Follett, and Rodney W. Tulloch. Our Soils and Their Management. Danville: The Interstate Printers and Publishers, Inc., 1976.

2. Foth, H.D. and L.M. Turk. Fundamentals of Soil Science. 5th Edition, New York: John Wiley and Sons, Inc., 1972.

3. Knuti, Leo L. and Milton Korpi. Profitable Soil Management. 2nd Edition, Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1970.

4. Stallings, J.H. Soil Use and Improvement. Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1957.

C. Special Arrangements

1. Materials

Map showing general soil areas and associated soil series of Louisiana (Contact the Soil Conservation Service)

2. Travel

Visits to sites to examine soil profile.

3. Audio-visual Equipment

Overhead Projector/Transparency of soil profile.

II. Presentation of Lesson and Suggested Student Activities

A. Motivation

1. Visit a site to examine and study soil profiles at various depths on hillsides, slopes, roadsides, and escavation pits.

2. What is the difference between soil and dirt?

B. Content Outline

1. Terms

   a. Soil -- the mineral and organic matter that supports plant growth on the earth's surface. It is a mixture of particles of rock, organic materials, living forms, air, and water.

   b. Soil profile -- a vertical cross section of a soil that shows the soil layers one below the other and parallel to the land surface (Transparency I-1-C).

   c. Subsoil -- that part of the soil profile directly under the surface soil.

   d. Topsoil -- the uppermost layer of the soil profile that is normally cultivated during tillage.

2. Soil

   Soil is the loose surface material of the earth in which plants grow. Nature worked thousands of years to make the soil. Soils continue to develop and change very slowly year after year

   a. Soil is the mineral and organic matter that supports plant growth on the earth's surface. It is a mixture of particles of rock, organic materials, living forms, air, and water.

   b. Soils differ in their productive capacity because of differences in amounts of organic materials, living forms, air, and water. Some soils are just naturally fertile and can produce any worthwhile crops. Such soils are known as productive soils. (Transparency I-1-A)

   c. A vertical section (profile) of soil usually shows three natural layers known as horizons. The horizons can be identified by color changes, texture, structure, or by differences in chemical composition. The surface soil is the A-horizon, the subsoil is the B-horizon, and the parent material is the C-horizon. (Transparency I-1-B)

1) The A-horizon is the layer of soil that supports most plant and animal life and is higher in organic matter than other layers. Most of the bacteria and fungi are found in this layer. As a result, the A-horizon is usually darker in color than the other layers.

2) The B-horizon of most soils is a zone of natural accumulation and is known as the subsoil. It usually contains more clay than the A-horizon and is lighter in color.

3) The C-horizon is the parent material. The parent material may be bedrock or unconsolidated material.

The C-horizon contains material that has undergone little or no change during the development of the A and B-horizons.

d. The General Soil Areas of Louisiana

There are six general soil areas of Louisiana, and within each are the important soil series.

1) Coastal Plain -- approximately 6,800,000 acres and includes the pine-forested sandy and clayey hill soils of the western, northcentral, and southeastern parts of the state.

Soils in this area are used chiefly for growing pine timber and cattle grazing.

2) Mississippi Terraces and Loessial Hills -- found mainly in the northeastern, southcentral, and southeastern parts of the state. Used mostly for grass pasture, forest, improved pasture for beef and dairy cattle and crops such as

cotton, corn, sweet potatoes, oats, and sugarcane.

3) Flatwoods -- found mainly in southwestern, southeastern, central, northern, and northwestern parts of the state. Used mainly for pine forest although some strawberries are grown in the southeastern area of flatwoods.

4) Coastal Prairies -- found mostly in the southwestern part of the state. Used mainly for rice, pasture, and hay.

5) Recent Alluvium -- most of the alluvium in this area has been deposited by the Mississippi. The largest area of Mississippi alluvium are found from around the central part of the northeast corner of the state. The alluvial soils of the northwest part of the state were laid down by the Red River.

   Used mainly for sugarcane, corn, soybeans, rice, cotton, pastures, forest, oats, and hay.

6) Coastal Marsh -- these soils comprise a low wet plain along the Gulf of Mexico which supports a luxuriant growth of grasses, sedges, rushes, and plants that can tolerate brackish and salt water.

   This area is used mainly for hunting, fishing, trapping, and recreation. Some areas are also used for grazing, growing rice, sugarcane, and pastures.

C. Suggested Student Activity

1. Draw and label a soil profile and discuss diagram with class.
2. Collect and mount pictures showing soils of different areas.

3. Brief presentation to class on the importance of soils to man.

4. Examine map which shows general soil areas and associated soil series groups of Louisiana. (Check with your local Soil Conservation Service) (Transparencies I-1-D,E,&F)

D. Suggested Study Questions

1. Define soil.

2. Describe the characteristics of surface soil.

3. Describe the characteristics of subsoil.

4. Define soil profile.

5. Illustrate a soil profile.

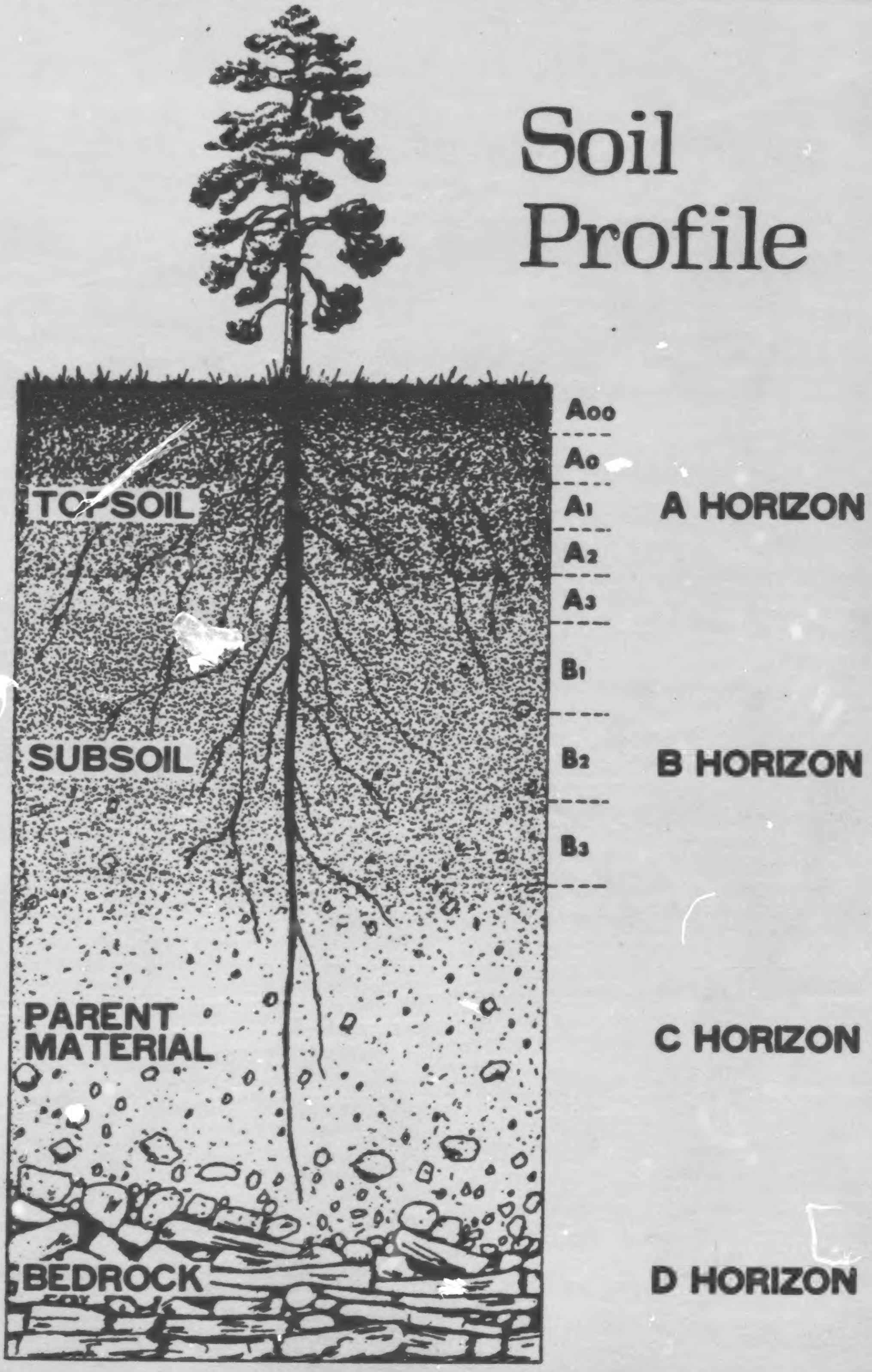
6. What usually causes the A-Horizon to be darker in color?

7. In what layer of the soil horizon do you find most bacteria and fungi?

8. What characteristics make soils different in their productive capacity?

9. List the six general soil areas found in Louisiana.

Soil Profile


Aoo
Ao
TOPSOIL
A1
A HORIZON
A2
A3
B1
SUBSOIL
B2
B HORIZON
B3
PARENT MATERIAL
C HORIZON
BEDROCK
D HORIZON

TRANSPARENCY I-1-A

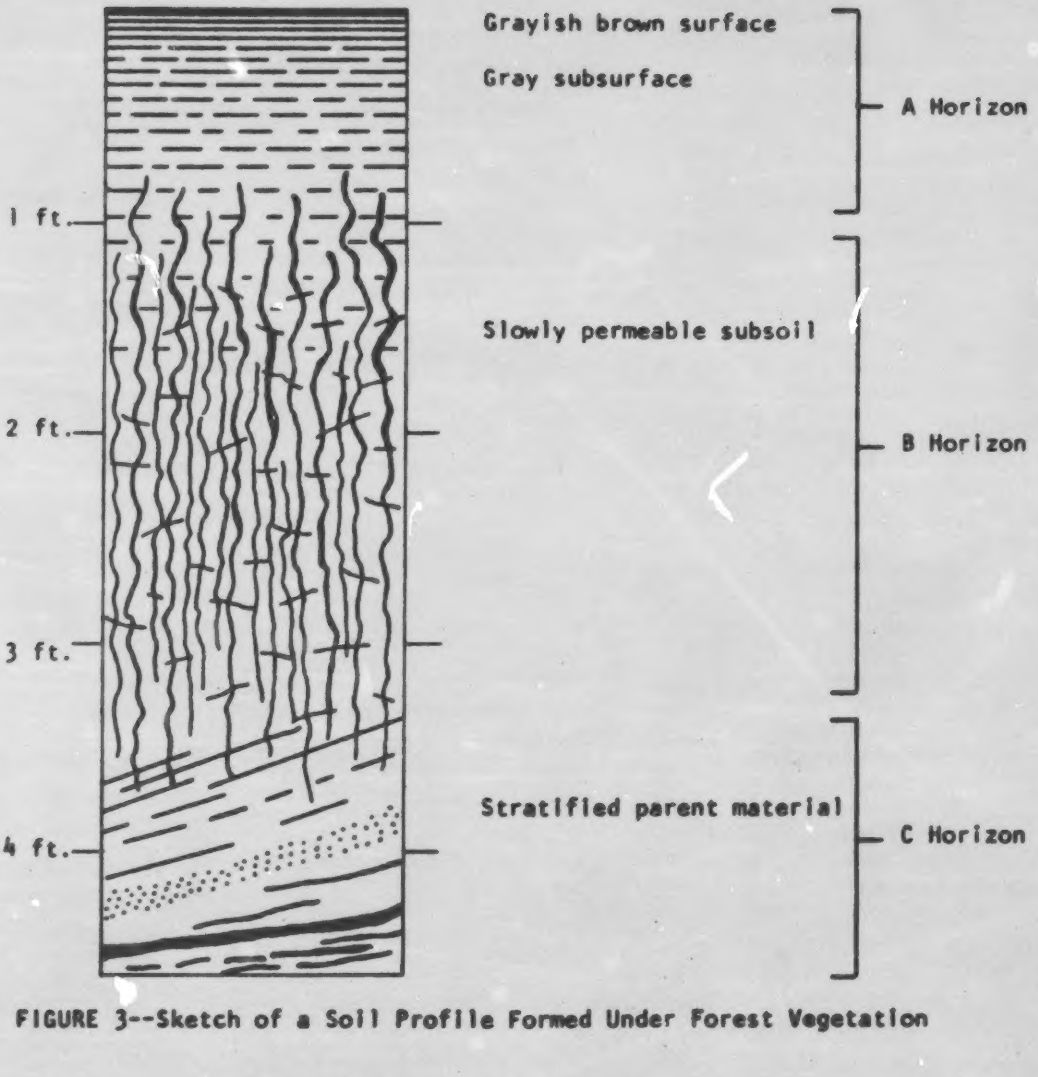
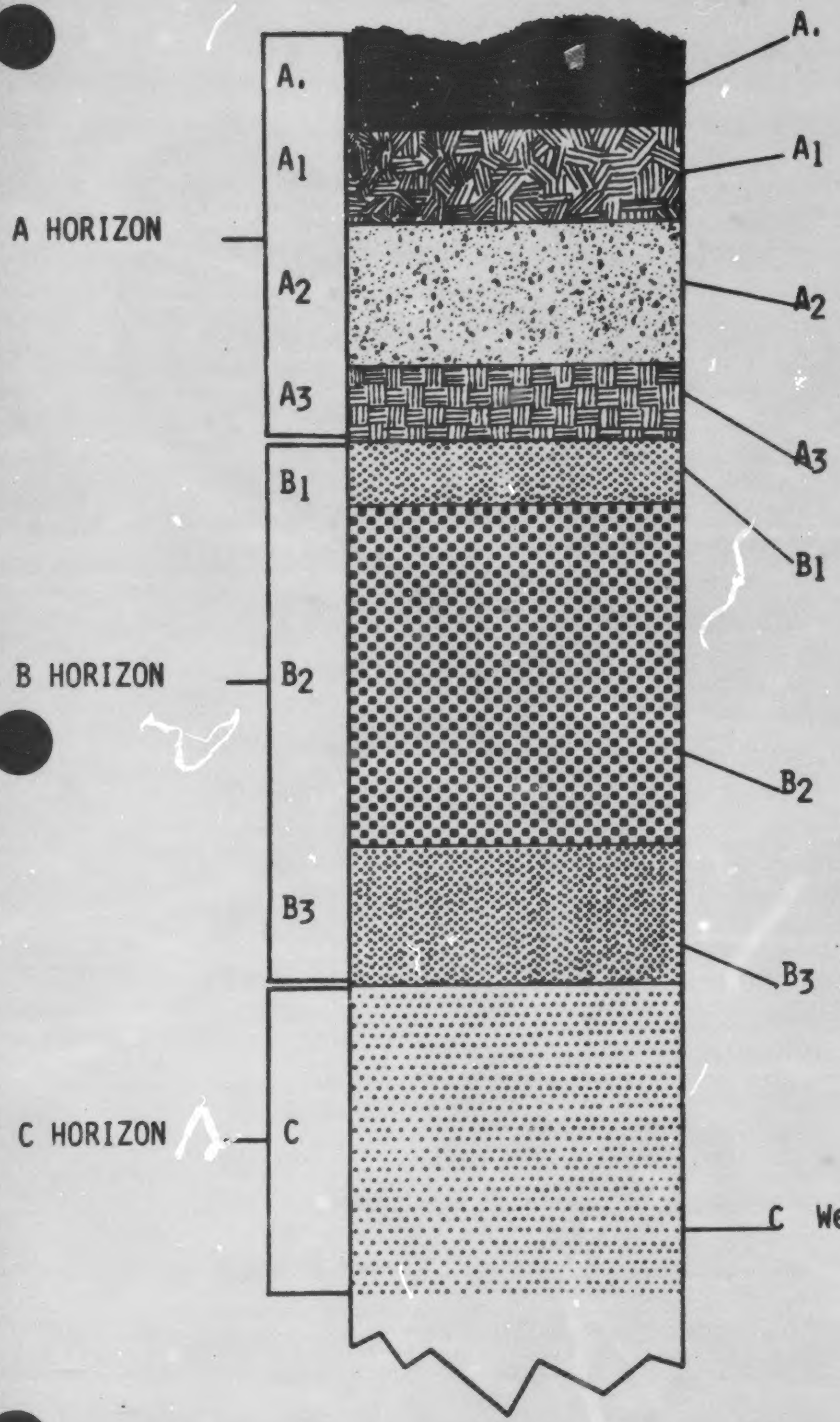

Grayish brown surface
Gray subsurface
A Horizon
1 ft.
Slowly permeable subsoil
2 ft.
B Horizon
3 ft.
Stratified parent material
4 ft.
C Horizon

FIGURE 3--Sketch of a Soil Profile Formed Under Forest Vegetation

TRANSPARENCY I-1-B



A. Partially decomposed organic debris; frequently absent

A_1 A dark-colored horizon with a medium to high content of organic matter

A_2 A light-colored horizon of maximum removal of materials dissolved or suspended in water

A_3 Transitional to B but more like A than B; frequently absent

B_1 Transitional to B but more like B than A; sometimes absent

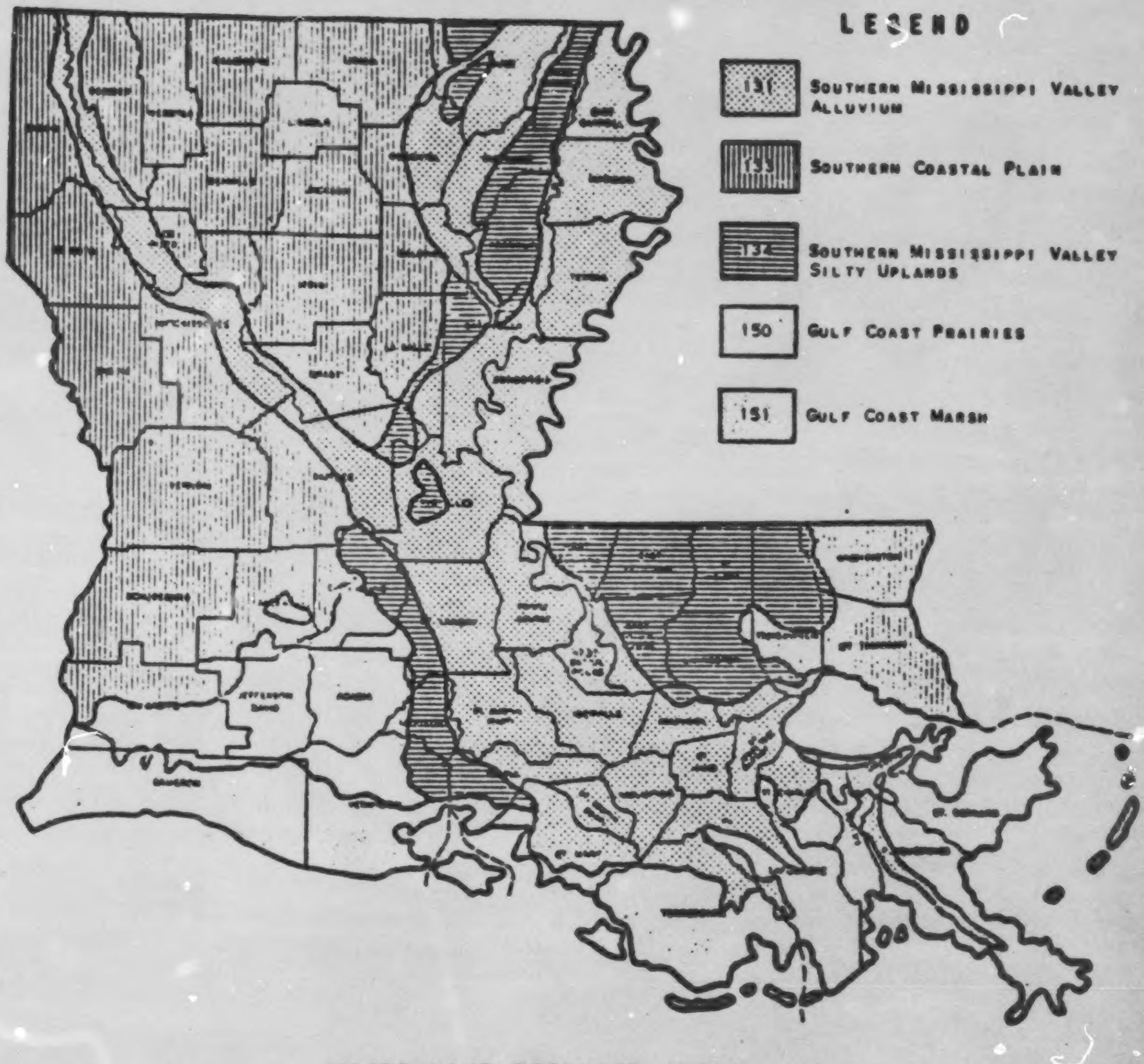
B_2 A deeper colored (usually) horizon with the maximum accumulation of clay materials; maximum development of blocky structure

B_3 Transitional to C but more like B than C

C Weathered parent material

THE SOIL PROFILE

TRANSPARENCY I-1-C


LEGEND
131 SOUTHERN MISSISSIPPI VALLEY ALLUVIUM
133 SOUTHERN COASTAL PLAIN
134 SOUTHERN MISSISSIPPI VALLEY SILTY UPLANDS
150 GULF COAST PRAIRIES
151 GULF COAST MARSH

MAJOR LAND RESOURCE AREAS
LOUISIANA

0 50 100 150 Miles

Reference Soils Memo SCS-49

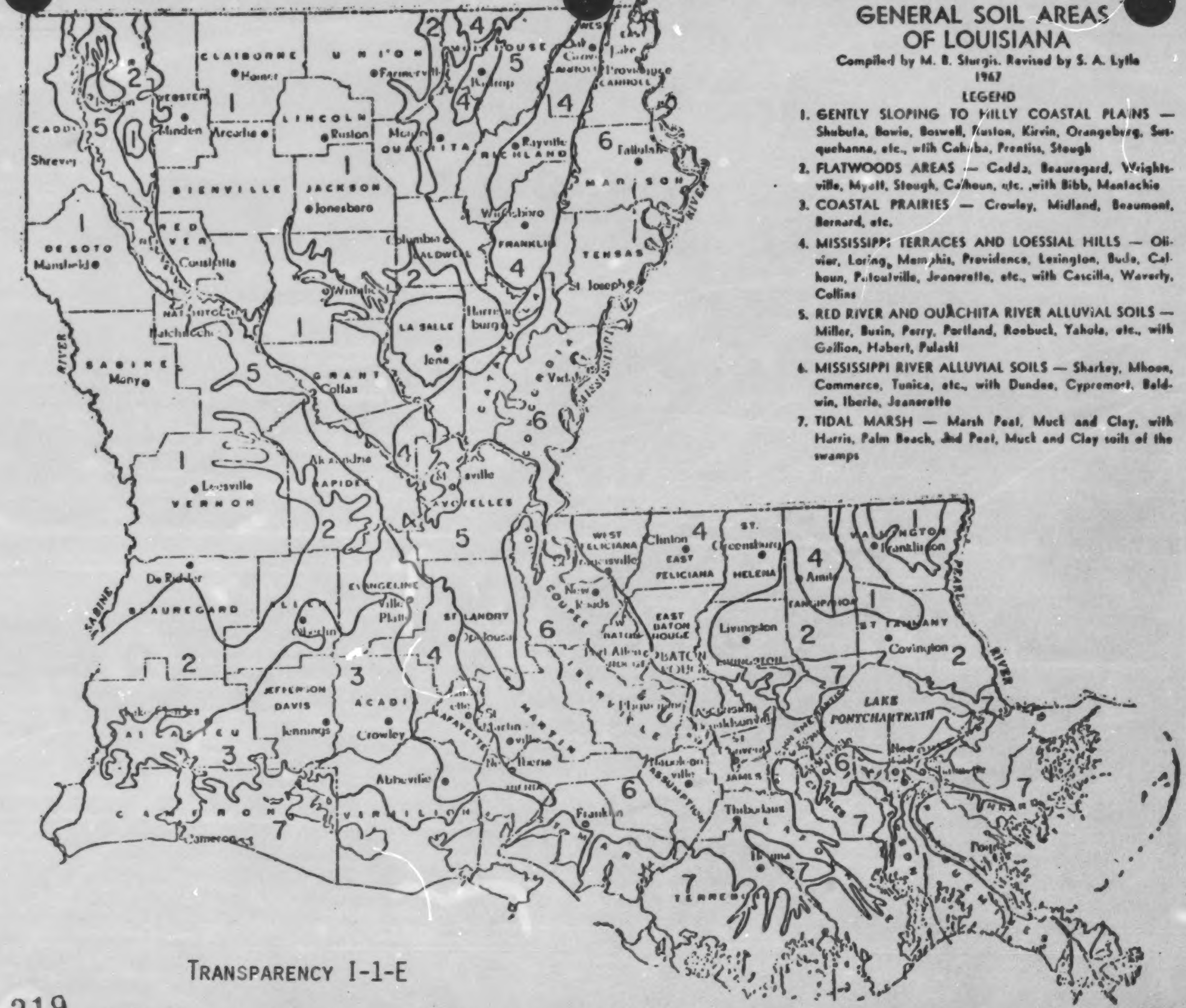
7-64 4-L-19104

U. S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, Alexandria, Louisiana

Base 4-L-25779A

318

TRANSPARENCY I-1-D


CADDO
Shreveport
WEBSTER
Minden
CLAIBORNE
Homer
UNION
Farmerville
LINCOLN
Ruston
Arcadia
MOREHOUSE
Bastrop
OUACHITA
Monroe
RICHLAND
Rayville
WEST CARROLL
EAST CARROLL
Lake Providence
MADISON
Tallulah
BIENVILLE
JACKSON
Jonesboro
FRANKLIN
Winnsboro
CALDWELL
Columbia
DE SOTO
Mansfield
RED RIVER
Coushatta
TENSAS
St. Joseph
NATCHITOCHES
Natchitoches
Winnfield
LA SALLE
Jena
Harrisonburg
CATAHOULA
CONCORDIA
Vidalia
SABINE
Many
GRANT
Colfax
RAPIDES
Alexandria
AVOYELLES
Marksville
VERNON
Leesville
De Ridder
BEAUREGARD
ALLEN
Oberlin
EVANGELINE
Ville Platte
ST. LANDRY
Opelousas
POINTE COUPEE
New Roads
WEST FELICIANA
St. Francisville
EAST FELICIANA
Clinton
ST. HELENA
Greensburg
WASHINGTON
Franklinton
TANGIPAHOA
Amite
ST. TAMMANY
Covington
LIVINGSTON
Livingston
EAST BATON ROUGE
WEST BATON ROUGE
Port Allen
BATON ROUGE
IBERVILLE
Plaquemine
ASCENSION
Donaldsonville
ST. JAMES
ASSUMPTION
Napoleonville
LAFOURCHE
Thibodaux
ST. JOHN THE BAPTIST
ST. CHARLES
LAKE PONTCHARTRAIN
TERREBONNE
Houma
ST. MARY
Franklin
IBERIA
New Iberia
ST. MARTIN
St. Martinville
LAFAYETTE
Lafayette
VERMILION
Abbeville
ACADIA
Crowley
JEFFERSON DAVIS
Jennings
CALCASIEU
Lake Charles
CAMERON
Cameron
ST. BERNARD
PLAQUEMINES
Pointe a la Hache
SABINE RIVER
RED RIVER
MISSISSIPPI RIVER
PEARL RIVER
1
2
3
4
5
6
7

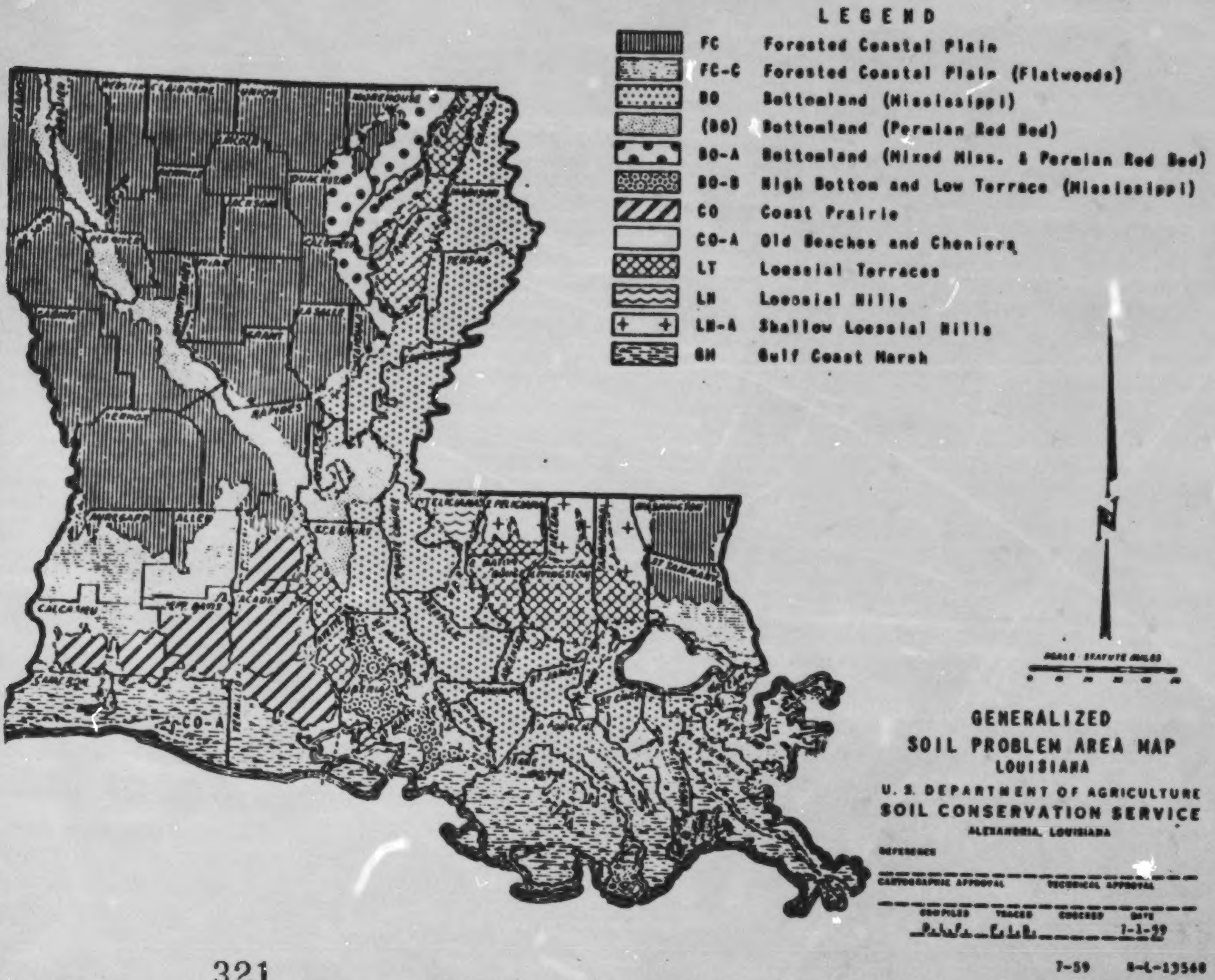
GENERAL SOIL AREAS OF LOUISIANA

Compiled by M. B. Sturgis. Revised by S. A. Lytle
1967

LEGEND

1. GENTLY SLOPING TO HILLY COASTAL PLAINS — Shubuta, Bowie, Boswell, Ruston, Kirvin, Orangeburg, Susquehanna, etc., with Cahaba, Prentiss, Stough
2. FLATWOODS AREAS — Caddo, Beauregard, Wrightsville, Myatt, Stough, Calhoun, etc. ,with Bibb, Mantachie
3. COASTAL PRAIRIES — Crowley, Midland, Beaumont, Bernard, etc.
4. MISSISSIPPI TERRACES AND LOESSIAL HILLS — Olivier, Loring, Memphis, Providence, Lexington, Bude, Calhoun, Patoutville, Jeanerette, etc., with Cascilla, Waverly, Collins
5. RED RIVER AND OUÂCHITA RIVER ALLUVIAL SOILS — Miller, Buxin, Perry, Portland, Roebuck, Yahola, etc., with Gallion, Hebert, Pulaski
6. MISSISSIPPI RIVER ALLUVIAL SOILS — Sharkey, Mhoon, Commerce, Tunica, etc., with Dundee, Cypremort, Baldwin, Iberia, Jeanerette
7. TIDAL MARSH — Marsh Peat, Muck and Clay, with Harris, Palm Beach, and Peat, Muck and Clay soils of the swamps

TRANSPARENCY I-1-E


LEGEND
FC Forested Coastal Plain
FC-C Forested Coastal Plain (Flatwoods)
BO Bottomland (Mississippi)
(BO) Bottomland (Permian Red Bed)
BO-A Bottomland (Mixed Miss. & Permian Red Bed)
BO-B High Bottom and Low Terrace (Mississippi)
CO Coast Prairie
CO-A Old Beaches and Cheniers
LT Loessial Terraces
LH Loessial Hills
LH-A Shallow Loessial Hills
GM Gulf Coast Marsh
CO-A
N
SCALE STATUTE MILES
GENERALIZED
SOIL PROBLEM AREA MAP
LOUISIANA
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ALEXANDRIA, LOUISIANA
REFERENCE
CARTOGRAPHIC APPROVAL
TECHNICAL APPROVAL
COMPILED
TRACED
CHECKED
DATE
1-1-59
7-59
4-L-13568

TRANSPARENCY I-1-F

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT I: Soil Formation

LESSON 2: Composition of Soil: Sources and Contents

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Identify the components of soil and the factors that determine its productivity.

2. Specific:

    a. List the four main components found in a normal soil.
    b. Explain the composition of the solid part of the soil.
    c. Describe the two main sources of organic matter.
    d. Name the approximate percentage in which each of the soil properties is found in a normal soil.
    e. Differentiate between
        1) A soil low in organic matter, and
        2) A soil high in organic matter.
    f. Explain the value of each soil component with regard to the proper growth of the plant.
    g.

    h.

    i.

B. Review Teaching Material

1. Donahue, Roy L., Roy H. Follett, and Rodney W. Tulloch. Our Soils and Their Management. Danville: The Interstate Printers and Publishers, Inc., 1976.

2. Foth, H.D. and L.M. Turk. Fundamentals of Soil Science. 5th Edition, New York: John Wiley and Sons, Inc., 1972.

3. Knuti, Lie L. and Milton Korpi. Profitable Soil Management. 2nd Edition, Englewood, Cliffs, New Jersey: Prentice Hall, Inc., 1970.

4. Stalling, J.H. Soil Use and Improvement. 1st Edition, Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1957.

5. "The Story of Soil and How to Keep it Productive," American Plant Food Council, Copyright 1952.

C. Special Arrangements

1. Materials

Samples of soil.

2. Audio-visual Equipment

Overhead projector/transparency of circle showing approximate percentage by volume in which each of the properties of soil is found.

II. Presentation of Lesson and Suggested Student Activities

A. Motivation -- Have the pupils compile a list of those things they think are found in soils from the various soil samples.

B. Content Outline

1. Terms

   a. Soil Pores -- the spaces between soil particles.

   b. Organic Matter -- the decomposing plant or animal residue.

   c. Inorganic Matter -- derived from the decomposition of the parent rock.

2. Soil (Transparencies I-2-A,B,C,D,& E)

   a. The soil is 50% solid and 50% pore spaces by total volume.

   b. The 50% solid portion is composed of organic (5%) and inorganic (45%) materials.

   c. The soil pore spaces are filled with either water or air.

   d. Of the 50% pore spaces, about 25% are air and 25% are water. These percentages will vary.

   e. During very heavy rain the percentage of water spaces will greatly increase.

   f. When dry this same soil will have a large percentage of air space.

   g. The surface soil will tend to have more organic matter and air than the subsoil.

   h. The inorganic portions of the soil vary in size.

   i. The inorganic matter is derived mainly from the breakdown of rocks and minerals from which the soil is formed.

   j. The inorganic materials help to supply the soil with essential plant nutrient elements, such as potassium, phosphorus, magnesium, calcium, sulphur, etc.

   k. The organic matter is derived from living and dead plants and animals.

l. It is composed of such things as the roots of plants, green manure crops, leaves, worms, bacteria, farmyard manure, crop residue, and insects which are in an active state of decay.

m. The organic matter is a major source of phosphorus, sulphur, and nitrogen.

n. Organic matter helps to make the soil friable and loose.

o. Organic matter also increases the moisture holding capacity of the soil, and during the process of decomposition it supplies energy for microorganisms and makes the soil easy to till.

p. Conditions are good for plant growth when there is about an equal amount of air and water in the pore space.

q. Absence of air or water can have adverse effects on plant life.

C. Suggested Student Activity

1. Draw a circle and in this circle indicate the appropriate percentage by volume in which each of the properties of the soil is found in a normal soil.

2. Have students examine samples of soil that contain:

   a. Large amounts of organic matter

   b. Small amounts of organic matter

   c. High moisture content

   d. Low moisture content

3. Have students note the compactness or noncompactness of each sample.

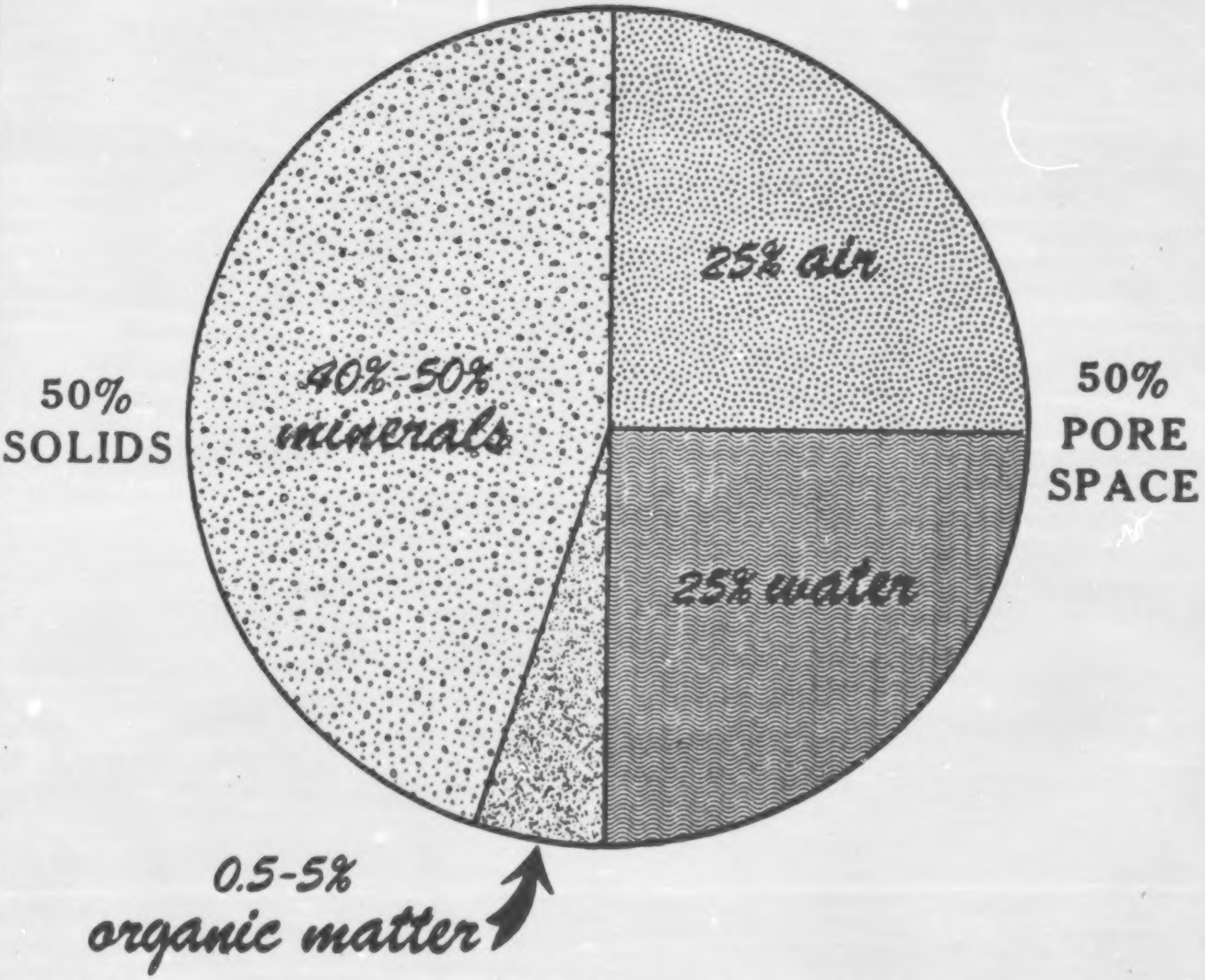
D. Suggested Study Questions

1. Define soil pores, organic matter, and inorganic matter.

2. Describe the composition of soil.

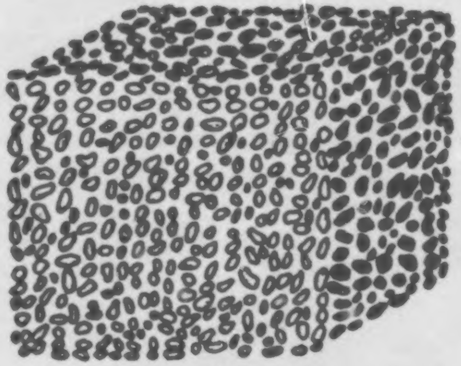
3. How is pore space filled?
4. Explain how weather conditions affect pore space.
5. Where is organic matter derived?
6. Where is inorganic matter derived?
7. What are the benefits of organic matter?
8. What are the components of soil? List the factors that determine its productivity.

VOLUME COMPONENTS OF A TYPICAL SOIL WITH GOOD PHYSICAL STRUCTURE

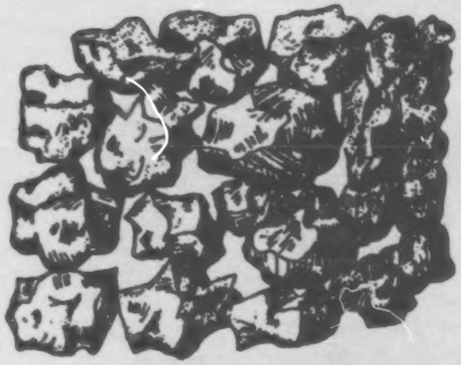


TRANSPARENCY I-2-A

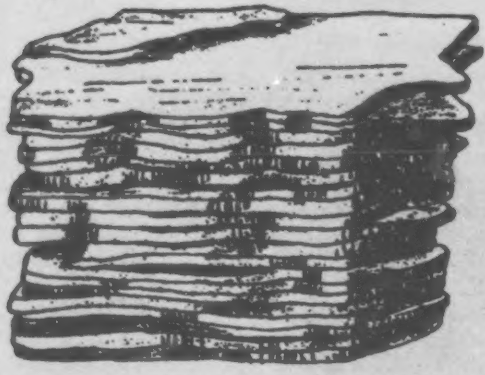
Soil Structure



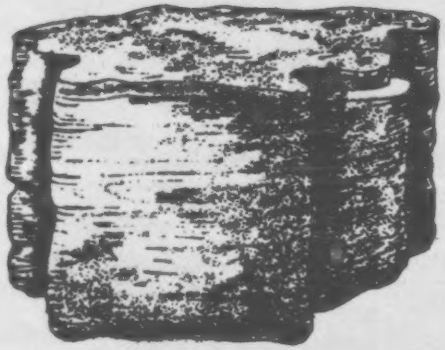
SINGLE GRAIN



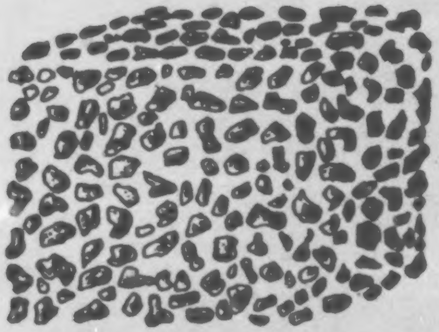
BLOCKY



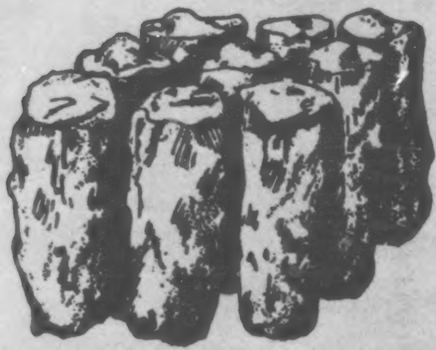
PLATY



MASSIVE



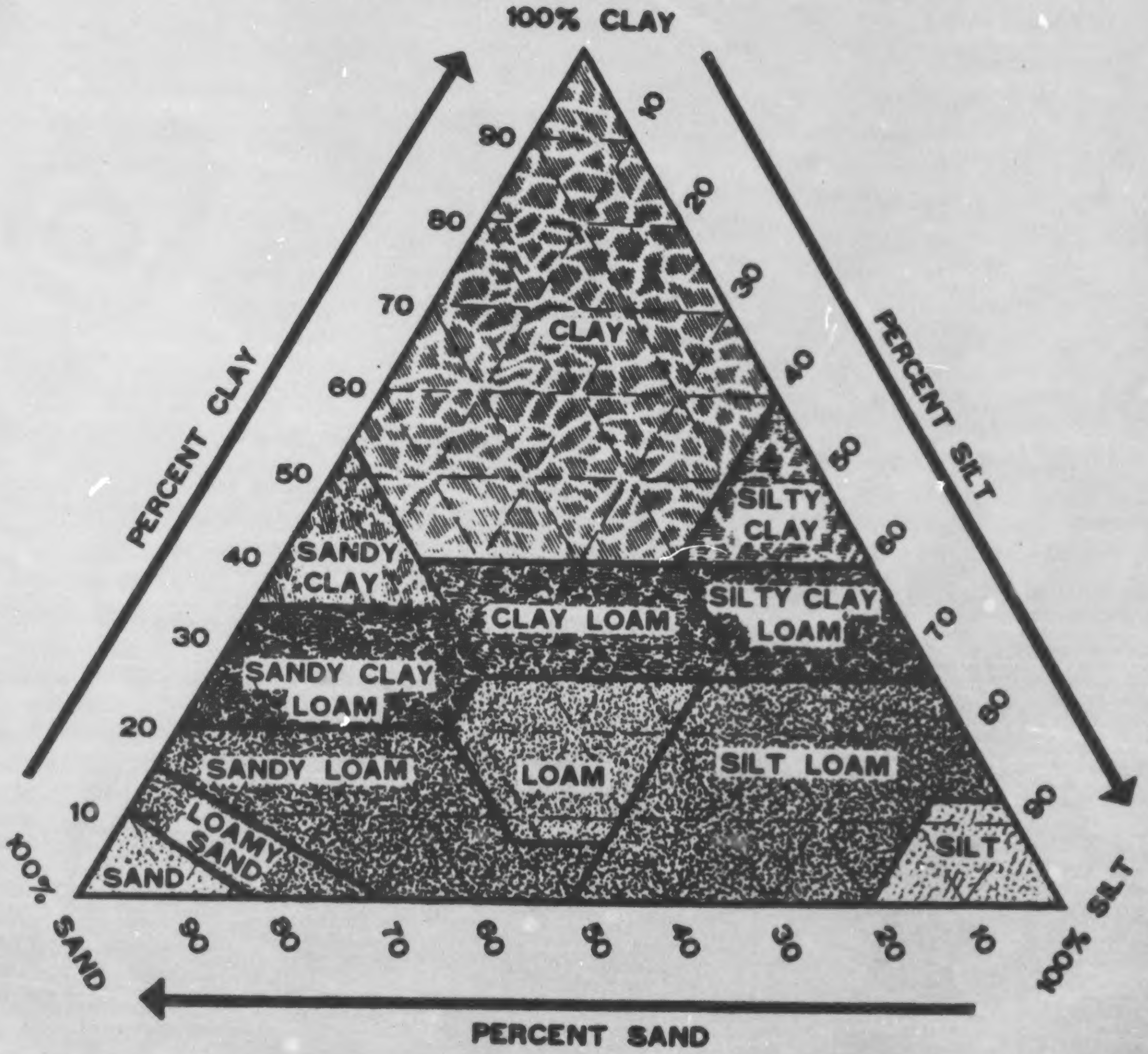
GRANULAR



PRISMATIC

TRANSPARENCY I-2-B

Soil Triangle


100% CLAY
PERCENT CLAY
PERCENT SILT
PERCENT SAND
100% SAND
100% SILT
90
80
70
60
50
40
30
20
10
CLAY
SILTY CLAY
SANDY CLAY
CLAY LOAM
SILTY CLAY LOAM
SANDY CLAY LOAM
LOAM
SILT LOAM
SANDY LOAM
LOAMY SAND
SAND
SILT

TRANSPARENCY I-2-C

SOIL TEXTURAL CLASSES

▶ **SAND** — DRY: LOOSE AND SINGLE GRAINED; FEELS GRITTY. MOIST: WILL FORM VERY EASILY-CRUMBLED BALL. SAND--85-100%, SILT--0-15%, CLAY--0-10%.

▶ **LOAMY SAND** — DRY: SILT AND CLAY MAY MASK SAND; FEELS LOOSE, GRITTY. MOIST: FEELS GRITTY; FORMS EASILY-CRUMBLED BALL; STAINS FINGERS SLIGHTLY. SAND--70-90%, SILT--0-30%, CLAY--0-15%.

▶ **SANDY LOAM** —DRY: CLODS EASILY BROKEN; SAND CAN BE SEEN AND FELT. MOIST: MODERATELY GRITTY; FORMS BALL THAT CAN STAND CAREFUL HANDLING; DEFINITELY STAINS FINGERS. SAND--43-85%, SILT--0-50%, CLAY--0-20%.

▶ **LOAM** —DRY: CLODS MODERATELY DIFFICULT TO BREAK; MELLOW, SOMEWHAT GRITTY. MOIST: NEITHER VERY GRITTY NOR VERY SMOOTH; FORMS A FIRM BALL; STAINS FINGERS. SAND--23-52%, SILT--28-50%, CLAY--7-27%.

▶ **SILT LOAM** —DRY: CLODS DIFFICULT TO BREAK; WHEN PULVERIZED FEELS SMOOTH, SOFT AND FLOURY, SHOWS FINGERPRINTS. MOIST: HAS SMOOTH OR SLICK "BUTTERY" OR "VELVETY" FEEL; STAINS FINGERS. SAND--0-50%, SILT--50-88%, CLAY--0-27%.

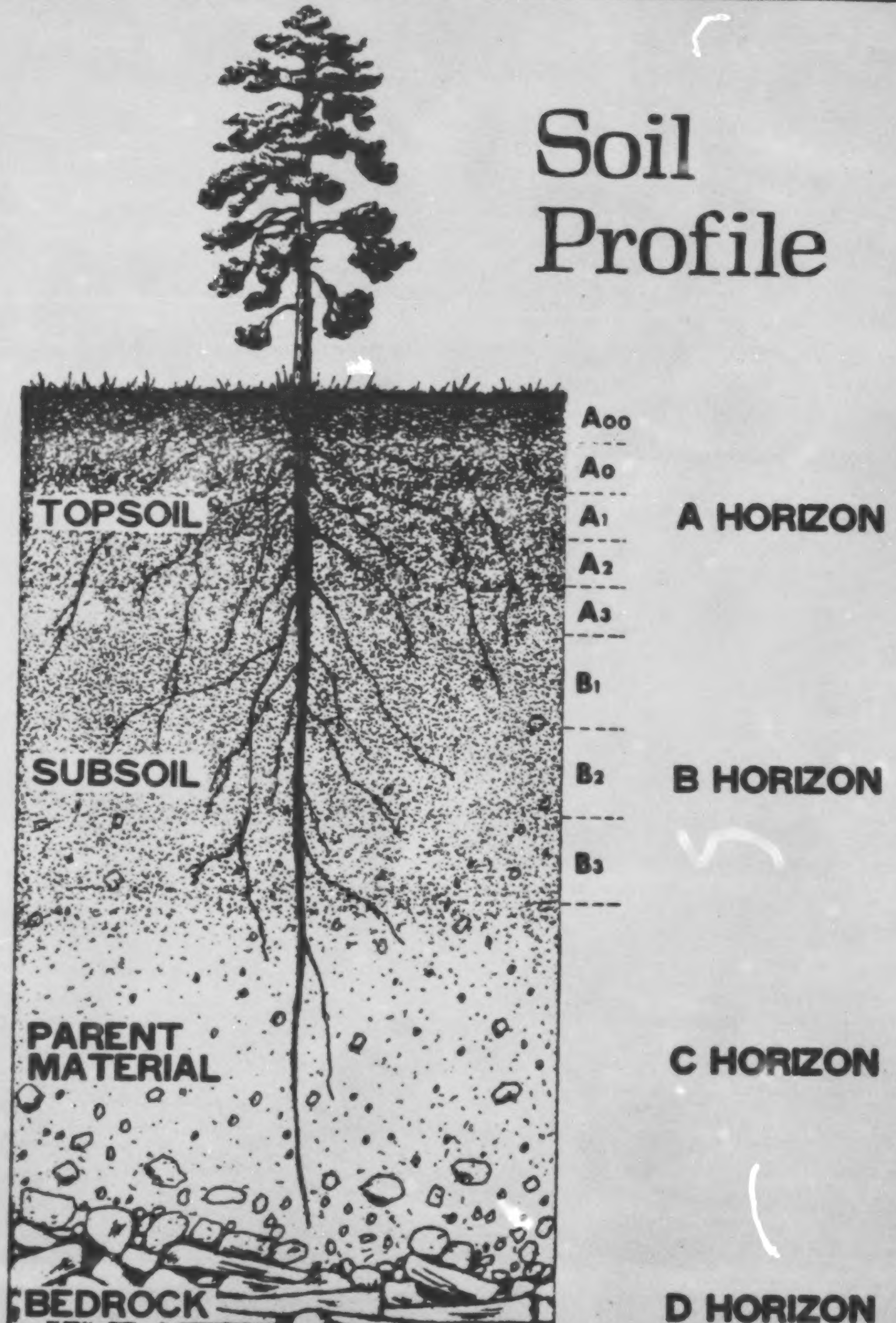
▶ **CLAY LOAM** — DRY: CLODS VERY DIFFICULT TO BREAK WITH FINGERS. MOIST: HAS SLIGHTLY GRITTY FEEL; STAINS FINGERS; RIBBONS FAIRLY WELL. SAND--20-45%, SILT-15-53%, CLAY--27-40%.

▶ **SILTY CLAY LOAM** —SAME AS ABOVE BUT VERY SMOOTH. SAND--0-20%, SILT--40-73%, CLAY--27-40%.

▶ **SANDY CLAY LOAM** —SAME AS FOR CLAY LOAM. SAND--45-80%, SILT--0-28%, CLAY--20-35%.

▶ **CLAY** — DRY: CLODS CANNOT BE BROKEN WITH FINGERS WITHOUT EXTREME PRESSURE. MOIST: QUITE PLASTIC AND USUALLY STICKY WHEN WET; STAINS FINGERS. (A SILTY CLAY FEELS SMOOTH, A SANDY CLAY FEELS GRITTY.) SAND--0-45%, SILT--0-40%, CLAY--40-100%.

Soil Profile


A00
A0
A1
A2
A3
B1
B2
B3
TOPSOIL
SUBSOIL
PARENT MATERIAL
BEDROCK
A HORIZON
B HORIZON
C HORIZON
D HORIZON

TRANSPARENCY I-2-E

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT I: Soil Formation

LESSON 3: Factors Affecting Soil Formation

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Identify factors that influence soil formation.

2. Specific:

   a. Describe soil formation.
   b. List the factors responsible for soil formation
   c. Name the factors that exert the most influence on soil formation.
   d. List the forms of plant life found in poor soil conditions.
   e.

   f.

   g.

B. Review Teaching Material

1. Donahue, Roy L., Roy H. Follett, and Rodney W. Tulloch. Our Soils and Their Management. Danville: The Interstate Printers and Publishers, Inc., 1976.

2. Foth, H.D. and L.M. Turk. Fundamentals of Soil Science. 5th Edition, New York: John Wiley and Sons, Inc., 1972.

3. Knuti, Leo L. and Milton Korpi. Profitable Soil Management. 2nd Edition, Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1970.

4. State Dept. of Education, "Soil Judging for Louisiana FFA."

13 C. Special Arrangement

1. Material

Soil survey map of parish.

2. Travel

Field tours to collect soil samples.

II. Presentation of Lesson and Suggested Student Activities

A. Motivation

Using a rock, sand, and soil, impress upon the students the amount of time it would take for rock (parent material) to become soil.

B. Content Outline

1. Terms

a. Topography -- the slope of the ground surface as determined by such features as mountains, hills, or plains.

b. Weathering -- the process by which rocks and minerals are changed to soils.

c. Soil formation -- process by which rocks and minerals are changed to soil during a period of time.

d. Rock -- solid and massive materials composed of one or more minerals.

e. Mineral -- a chemical compound neither animal nor vegetable, results from the inorganic processes of nature.

f. Loess -- a silty, floury material laid down by wind (fine soil particles)

g. Alluvium -- a material laid down by running water in the flood plains or bottomlands of streams.

2. Factors Affecting Soil Formation

Soils are what they are because of their heredity and environment. They started from a particular rock material and developed slowly over many years in a manner related to their natural surroundings. Thus each soil is the product of several factors. These factors are called factors of soil formation and are five in number as follows:

a. Parent material

b. Climate

c. Living organisms (mainly vegetation)

d. Topography (lay-of-the-land)

e. Time

The kind of soil at any one place is the result of the five factors working in combination at that place.

a. Parent Material

Soil parent material is loose and partly decayed rock. It provides the skeleton or framework of the soil. In addition, the decaying rock pieces furnish many nutrient chemical elements essential to the growth of plants.

There are four important soil parent materials in Louisiana. These are:

1) Finely pulverized rock materials or sediments deposited by running water called alluvium.

2) Finely pulverized rock materials or sediments deposited under the sea called marine deposits.

3) Finely pulverized rock materials or sediments deposited by wind called loess (pronounced luss).

4) Partially decomposed remains of plants referred to as organic materials.

Alluvium is material laid down by running water in the flood plains or bottomlands of streams. In Louisiana it consists mainly of silt and clay-sized particles, although some sand-sized particles are included. The alluvium has come from erosion of land surfaces throughout the watersheds of major rivers and their tributaries.

Marine deposits in Louisiana come mainly from the deposition of stream sediments beneath the sea. These in turn are mixed with other materials carried by ocean currents and waves. These become soil parent materials when the deposits are thrust upward by shifts in the earth's crust or by lowering of the sea level.

Loess is a silty, floury material laid down by wind. It contains very little sand and is mostly silt and clay-sized particles. The winds picked up these materials from the flood plains of the

Mississippi River during glacial times and deposited them on the nearby uplands.

Organic materials are the remains of plants in the various stages of decomposition. They occur mainly in the marshy areas along the Gulf Coast. As water covers these areas, much of the time it prevents or slows decomposition of plants. Peat and muck soils were formed from this organic materials.

Weathering of rocks provides soil parent material.

Weathering takes place mainly by either physical or chemical means.

Physical weathering -- this occurs as a result of mechanical agents, such as heating and cooling, freezing and thawing, or even the rubbing together of minerals. Materials from physical weathering are classified by the way they have been moved or scattered.

Chemical weathering -- this happens as a result of the action of water, oxygen, and carbon dioxide on the rocks. Carbon dioxide mixed with rain water causes the water to become slightly acid which speeds up the weathering of parent material.

New chemicals are formed in the soil from the decay products of the rocks and plants.

Humus has been built from plant and animal residues.

Clay minerals have been synthesized into something both physically and chemically different from the parent rock.

Soils developed from sandstone are coarse-textured and sandy.

Soils from shale are clay-like in texture but not very fertile.

Soils developed from limestone bedrock are usually dark in color, fine in texture, and very fertile. 17

Soils that develop from granite bedrock are usually sandy loams of low fertility.

b. Climate

Climate influences the breakdown of rocks and minerals and results in soil development. This process is called weathering. Weathering is a result of rainfall, freezing, thawing, sunshine, and wind. It is partly physical and partly chemical and works in combination with other factors of soil formation. Weathering breaks large rocks and rock fragment into smaller and smaller pieces which causes nutrients to be released from minerals. It causes soluble portions to be leached away and fine clay particles to move downward from the surface to the subsoil.

The climate can be looked upon as the single most important factor that affects soil formation.

Changes in temperature from day to night and from season to season will break rocks into scale-like pieces.

Rain water will dissolve some of the limestone and soften other parts of the rock.

Wetting and drying will cause expansion and contraction of the loosened limestone particles.

In some of the tiny cracks and rock depressions there will be enough water and available plant nutrients to support plant life.

The above procedure describes the process of soil formation as affected by temperature and climate.

Starting from limestone bedrock, the number of years of weathering to make soil depends mostly upon the climate.

In northern Michigan, it takes approximately 2,000 years for 1" (2.5cm) of soil to develop from limestone, but in a warmer climate it takes approximately 1,000 years to develop 1" (2.5cm) of soil from limestone.

c. Living Organisms

Living organisms such as plants, animals, insects, bacteria, and fungi affect soil formation. Plants have the most important effect. They determine the kind and amount of organic matter in the soil. Animals and insects burrow in the soil and cause mixing of soil materials.

Under forest cover organic matter is added to the soil largely by leaves, twigs, and fallen logs. As forest vegetation is mainly on the surface, it decays rapidly and leaves only a small residue in the soil. Thus, forest soils are usually light in color and low in organic matter.

Lower forms of life, such as lichens, are among the first to establish themselves on slightly weathered bedrock.

After many years of growth and death of these tiny plants, higher plant forms, such as the mosses, become established.

Generation after generation of lichens and mosses grow and die until the organic matter from their decaying tissue helps to make a better environment for the establishment of seed-bearing plants.

Annual weeds migrate into area followed in a few years by grasses and shrubs.

If the rain-fall is adequate, a hardwood forest will gradually dominate the vegetation.

19 Bacteria, fungi, insects, and other animals are constantly a part of the environment during soil formation.

d. Topography

Topography refers to "lay-of-the-land" or slope. In Louisiana, topography ranges from level to very steep. Topography affects soil formation because it influences runoff, drainage, and rate of erosion of the soil. Also, it may influence the amount and type of vegetation growing on the surface.

In general, strongly sloping to steep land has a high rate of water runoff. The amount of water absorbed and retained is limited, and soil drainage is generally good. On sloping land there is considerable erosion which results in constant removal of surface materials. Plant growth on steep slopes may be somewhat restricted because of moisture shortages and undue exposure to sun and wind. Consequently, soils formed on these slopes tend to have a rather thin surface layer.

Level and gently sloping lands lose very little rain by runoff, and erosion losses are small. Most of the rain enters the soil where it influences profile development and encourages abundant plant growth.

Large areas of level lands occur in the Mississippi and Red River bottomlands, in southwestern Louisiana, and along the Gulf Coast. Smaller areas of level or nearly level land occur throughout the state. Steeper slopes occur in the northern and central sections in the uplands adjacent to the major streams.

Topography directly affects the rate at which water runs off.

If water runs off at a quick rate, such as on a slope, the soil forming process takes a longer time.

With less water, it takes a longer time for the higher forms of plant life to develop; thus, organic matter is added in smaller quantities and at a slower rate.

In a flat area, there is more water held. This helps to hasten the plant rebirth, and organic matter is added faster because of rapid decomposition.

Therefore, steep slope soil develops very slowly, whereas, on a flat area, it develops much faster.

Soil development can be retarded by excessive amounts of water.

e. Time

Time is needed to make a soil. It may be a matter of centuries or just a few days. As soon as a material has become unconsolidated (loose) enough to have water, air, and nutrients for growing plants, it can be thought of as a soil. Thus, an alluvial soil can be formed in just a few days, when a flood lays down sediment over an area. On the other hand, it takes centuries to develop a soil with well defined horizons.

In general, the longer a soil is exposed to soil-forming processes, the greater is the degree of weathering. This means that rock fragments and minerals become finer and finer as soils increase in age. The horizons become well defined and the subsoil becomes high in clay content. The soil becomes more acid and nutrient elements are carried downward by movement of rainwater.

Time is one of the most important soil forming factors in Louisiana. The extreme age of the upland soils in northern and central Louisiana is primarily responsible for their low fertility and limited productive capacity. By contrast, the young, unweathered, and fertile soils of the bottomlands are prized most highly for production of high income crops such as sugarcane, cotton, soybeans, and corn.

C. Suggested Student Activities

Have students obtain soil samples of top soil and subsoil found in the community. These are to be used in later activities.

D. Suggested Study Questions

1. List the factors responsible for soil formation.

2. Describe how parent material affects soil formation.

3. a. Define loess soils.

   b. Define alluvial soils.

4. Explain how climate affects the soil.

5. Explain how living organisms increase soil formation.

6. a. Define topography.

   b. Explain its influence on surface runoff, drainage, and erosion of the soil.

7. Explain how time affected the formation of old and recent soils.

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT II: Soil Properties

LESSON 1: Physical Properties of Soil

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Explain the physical properties of soil and how they affect productivity.

2. Specific:

   a. Interpret the organic matter content of the surface soil using soil color.
   b. Interpret internal drainage of the subsoil by observing soil color.
   c. Distinguish between "light" and "heavy" soils.
   d. Determine the texture of a soil sample.
   e. Classify soil samples using the textural triangle as a guide.
   f. Explain the effects of soil structure on productivity.
   g.
   h.
   i.

B. Review Teaching Material

1. Donahue, Roy L., Roy H. Follett, and Rodney W. Tulloch. Our Soils and Their Management. Danville: The Interstate Printers and Publishers, Inc., 1976.

2. Foth, H.D. and L.M. Turk. Fundamentals of Soil Science. 5th Edition, New York: John Wiley and Sons, Inc., 1972.

3. Knuti, Lie L. and Milton Korpi. Profitable Soil Management. 2nd Edition, Englewood

Cliffs, New Jersey: Prentice Hall, Inc., 1970.

4. Stallings, J.H. Soil Use and Improvement. Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1957.

C. Special Arrangements

1. Materials needed

    a. Different sized strainers

    b. Different types of soil samples (sand, silt, clay)

    c. Graphic guide for textural classification (USDA Soil Conservation Service)

    d. Textural triangle

2. Shop or laboratory

II. Presentation of Lesson and Suggested Student Activities

A. Motivation

1. Sift soil through different sized strainers to separate the various soil particles.

2. Examine moistened samples of soils to determine soil textural classes.

3. Pass water through different soil samples to compare the porosity of different soils.

B. Content Outline

1. Terms

   a. Texture -- soil texture refers to the size of individual soil particles and expresses the relative proportions of the different sizes in a mass of soil. Specifically, it refers to the proportions of sand, silt, and clay in a soil. (Transparency II-1-A)

   b. Structure -- soil structure refers to the arrangement of soil particles. (Transparency II-1-B)

   c. Clay -- a soil separate consisting of particles less than 0.002mm in diameter.

   d. Silt -- a soil separate consisting of particles between 0.05 and 0.002mm in diameter.

   e. Sand -- a soil separate between 2.0mm and 0.05mm in diameter.

   f. Soil organic matter -- the organic fraction of the soil including plant and animal residues at various stages of decomposition; cells and tissues of soil micro-organisms, and substances synthesized by the soil population.

   g. Pore Space -- holes among soil particles and soil structural units.

   h. Subsoil -- that part of the soil that is directly under the surface. (B-Horizon)

   i. Surface soil -- the upper part of the soil ordinary moved in tillage. (A-Horizon)

   j. Parent material -- the unconsolidated mass of rock material from which the soil profile develops.

2. Factors used to describe soil (Transparencies II-1-F,G&H) Soil Maps

25

a. Soil Color -- Color of the surface soil is an indicator of the amount of organic matter present. In general, the darker colored soils are higher in organic matter and can supply more nitrogen for plants than the lighter gray soils.

Most Louisiana soils have light-colored surface layers but some are darker.

1) The subsoil on "B" horizon has a marked effect on water and air movements within the soil and a definite influence on growing plants.

2) Color of the subsoil (one to three feet below the surface) can be a valuable clue to the movement and relations of air and water.

3) When the subsoil has a uniformly bright color and has few or no gray streaks or spots (mottling), water movement is usually satisfactory and aeration is good.

4) Water movement is generally slow or impeded and aeration is often poor when subsoils are dominantly gray, with perhaps some streak of red or yellowish brown.

5) Subsoil colors that are dominantly yellowish brown or reddish brown but have considerable gray mottling are intermediate in water movement and aeration.

b. Soil Texture (Transparencies II-1-C&D)

The texture of a soil is a permanent soil characteristic. It is a direct result of soil parent material and long weathering processes.

Specifically, it refers to the proportions of sand, silt, and clay in a soil.

In general, light or coarse-textured soils tend to be droughty and low in fertility. Coarse-textured soils are easy to work. Fine-textured or heavy soils are hard to manage and impede water and air movement. Medium-textured soils have the greatest number of desirable characteristics and are most favorable from the standpoint of management and productivity. Soils are given textural names or classes that indicate the relative proportion of the various sized particles. The common soil textural classes in order of increasing amounts of clay, are as follows:

Coarse
1) Sand
2) Loamy Sand

Sandy

Medium
1) Loam
2) Silt Loam
3) Silt and Sandy Loam

Moderately Fine
1) Silty Clay Loam
2) Clay Loam
3) Sandy Clay Loam

Loamy

Fine
1) Clay
2) Silty Clay

Clayey

Soils that have fine textured, impervious subsoils result in poor water movement and poor aeration. (Transparency II-1-E)

c. Soil Structure
(Transparencies II-1-A,B,C,D&E)

1) Soil structure refers to the arrangement of soil particles. There are four main kinds of soil structure.

    a) Nearly round aggregates are said to have granular or crumb structure. Granular structure is usually found in the surface layer of uncultivated soils.

    b) Block-like aggregates are nearly square and referred to as blocky structure. Blocky structures are usually found in the subsoil or B-horizon. Most blocky structure is larger than granular and may have somewhat rounded sides even though the overall appearance is block-like.

c. Prismatic structure is similar to blocky but the aggregates have one axis longer than the other with the long axis vertical. Prismatic structure occurs in the subsoil.

d. Platy structures consist of aggregates that are wider than they are long. Platy structures are arranged like plates and are usually found in or just below the surface layer.

2) Structure is important in soils because it influences water intake, affects ease of tillage, and is responsible for pore space and cracks in the soil through which water and plant roots can move easily. Through these pore spaces excess water may drain away, leaving them filled with air.

This ensures adequate oxygen for plant roots, speeds up decomposition of organic matter, and releases available nutrients faster.

3) Man damages soil structure in the surface layer through cultivation.

4) Growing sod crops and returning crop residue to the soil helps improve surface soil structure.

C. Suggested Student Activity

1. The student should learn to read the textural triangle and classify soils using the triangle as a guide.

2. Collect soil samples and label them according to texture.

D. Suggested Study Questions

1. What is organic matter?
2. Where is organic matter usually found in soil?
3. What is the major influence on topsoil color?
4. Define topsoil.
5. How does aeration affect the color of the subsoil?
6. A dominantly grey subsoil is generally an indication of what type of internal drainage.
7. Define soil texture.
8. What is the relative size of sand, silt and clay particles?
9. What are the characteristics of light textured soil?
10. What texture of soils have the greatest number of desirable characteristics?
11. List the soil texture classes in order of increasing amounts of clay.
12. What is loamy soil?
13. Define soil structure.
14. List the types of soil structural units found in local soils.
15. How does soil structure affect water entry?
16. How does man adversely affect soil structure?
17. What practices can a producer use to improve soil structure?
18. Explain how the physical property of the soil affects productivity.

PROCEDURE FOR CONDUCTING LAB EXERCISE

Title: Soil Texture (shop or laboratory)

Objective: To show that soil particles are not all the same size. Large heavy particles settle out of a suspension quicker than fine light particles. This principle can be used to separate fine and coarse soil particles. Differences in soil texture among topsoils as well as among horizons of the same soil can be studied in this exercise.

Equipment:
1. Two quart jars for each student
2. A measuring cup
3. A supply of water

Procedure: This may be conducted as a team or individual exercise.

1. Each student should bring at least one pint of soil from two fields on his own farm that appear to be different in texture. Label A and B. If soils are similar, bring one sample from the topsoil and one from the subsoil. These samples should be dried and screened to remove roots and gravel. Record the number or weight of gravel remaining on the screen for each sample.

2. Number two quart jars #1 and #2.

3. Jar #1 Working with sample A: (a) put one cup of soil into quart jar #1 and add three cups of water; (b) allow this mixture to stand for 10 to 15 minutes; then shake vigorously; (c) allow it to stand a few minutes more and shake again. (d) This time allow the soil particles to settle for 30 seconds and then pour off about two cups of the water into jar #2. (e) Add another cup of water to jar #1 and shake. (f) Allow to stand 15 seconds. After this period pour one cup of water into jar #1 as before.

4. Jar #2: (a) shake jar #2 and after two minutes pour about two cups of water into the sink or another jar. (b) Add another cup of water to jar #2; shake and allow particles to settle.

5. Allow both jars to stand for 10 to 15 minutes then carefully pour off as much of the clear water that remains as possible.

6. Compare the amount of sediment in each jar.

	Depth in Inches	
Soil	Jar #1 Coarse	Jar #2 Medium
A		
B		

Measure the depth of the sediment in each jar and place the values in the table above. Also note differences between soil particles remaining in each jar. Jar #1 contains the coarse and jar #2 the medium sized particles. Allow the soil in each of the jars to dry and compare the particle size by feeling while dry and slightly moist. All of the solid particles are not accounted for in this way. Most clay and fine silt will not settle out in 15 minutes and will remain in the water poured from jar #2.

8. Repeat the entire procedure for sample B and others if desired.

SOIL TEXTURAL CLASSES

- **SAND** — DRY: LOOSE AND SINGLE GRAINED; FEELS GRITTY. MOIST: WILL FORM VERY EASILY-CRUMBLED BALL. SAND--85-100%, SILT--0-15%, CLAY--0-10%.

- **LOAMY SAND** — DRY: SILT AND CLAY MAY MASK SAND; FEELS LOOSE, GRITTY. MOIST: FEELS GRITTY; FORMS EASILY-CRUMBLED BALL; STAINS FINGERS SLIGHTLY. SAND--70-90%, SILT--0-30%, CLAY--0-15%.

- **SANDY LOAM** —DRY: CLODS EASILY BROKEN; SAND CAN BE SEEN AND FELT. MOIST: MODERATELY GRITTY; FORMS BALL THAT CAN STAND CAREFUL HANDLING; DEFINITELY STAINS FINGERS. SAND--43-85%, SILT--0-50%, CLAY--0-20%.

- **LOAM** —DRY: CLODS MODERATELY DIFFICULT TO BREAK; MELLOW, SOMEWHAT GRITTY. MOIST: NEITHER VERY GRITTY NOR VERY SMOOTH; FORMS A FIRM BALL; STAINS FINGERS. SAND--23-52%, SILT--28-50%, CLAY--7-27%.

- **SILT LOAM** —DRY: CLODS DIFFICULT TO BREAK; WHEN PULVERIZED FEELS SMOOTH, SOFT AND FLOURY, SHOWS FINGERPRINTS. MOIST: HAS SMOOTH OR SLICK "BUTTERY" OR "VELVETY" FEEL; STAINS FINGERS. SAND--0-50%, SILT--50-88%, CLAY--0-27%.

- **CLAY LOAM** — DRY: CLODS VERY DIFFICULT TO BREAK WITH FINGERS. MOIST: HAS SLIGHTLY GRITTY FEEL; STAINS FINGERS; RIBBONS FAIRLY WELL. SAND--20-45%, SILT-15-53%, CLAY--27-40%.

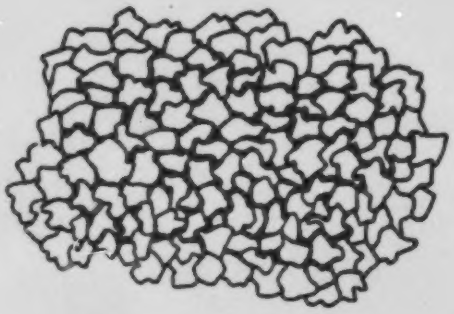
- **SILTY CLAY LOAM** —SAME AS ABOVE BUT VERY SMOOTH. SAND--0-20%, SILT--40-73%, CLAY--27-40%.

- **SANDY CLAY LOAM** —SAME AS FOR CLAY LOAM. SAND--45-80%, SILT--0-28%, CLAY--20-35%.

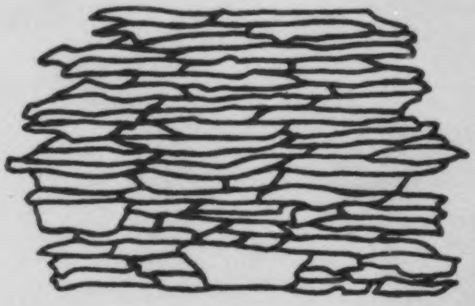
- **CLAY** — DRY: CLODS CANNOT BE BROKEN WITH FINGERS WITHOUT EXTREME PRESSURE. MOIST: QUITE PLASTIC AND USUALLY STICKY WHEN WET; STAINS FINGERS. (A SILTY CLAY FEELS SMOOTH, A SANDY CLAY FEELS GRITTY.) SAND--0-45%, SILT--0-40%, CLAY--40-100%.

TRANSPARENCY II-1-A

GRANULAR

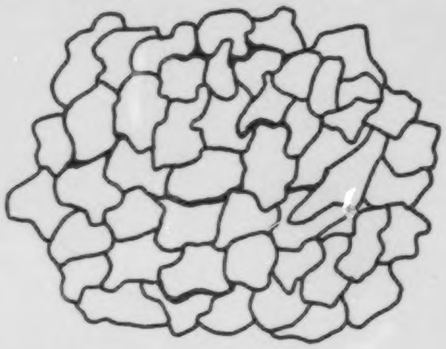


PLATY

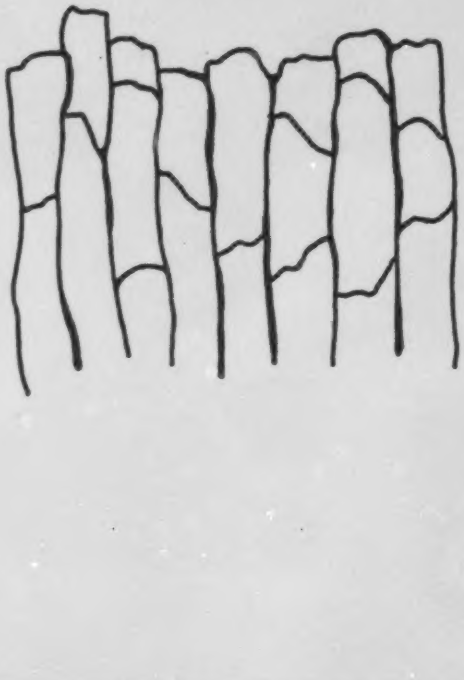


TYPES OF STRUCTURAL UNITS FOUND IN SOILS

BLOCKY

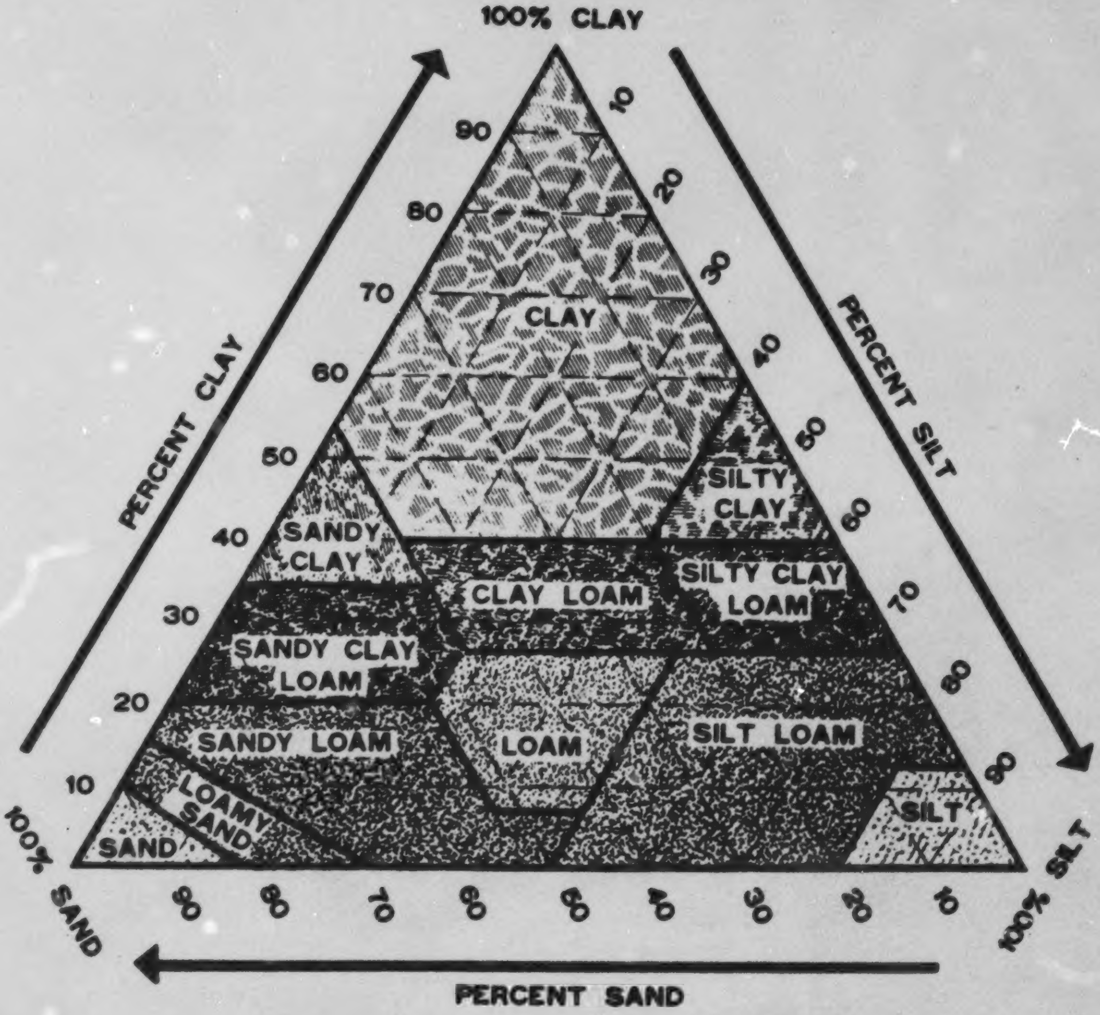


PRISMATIC



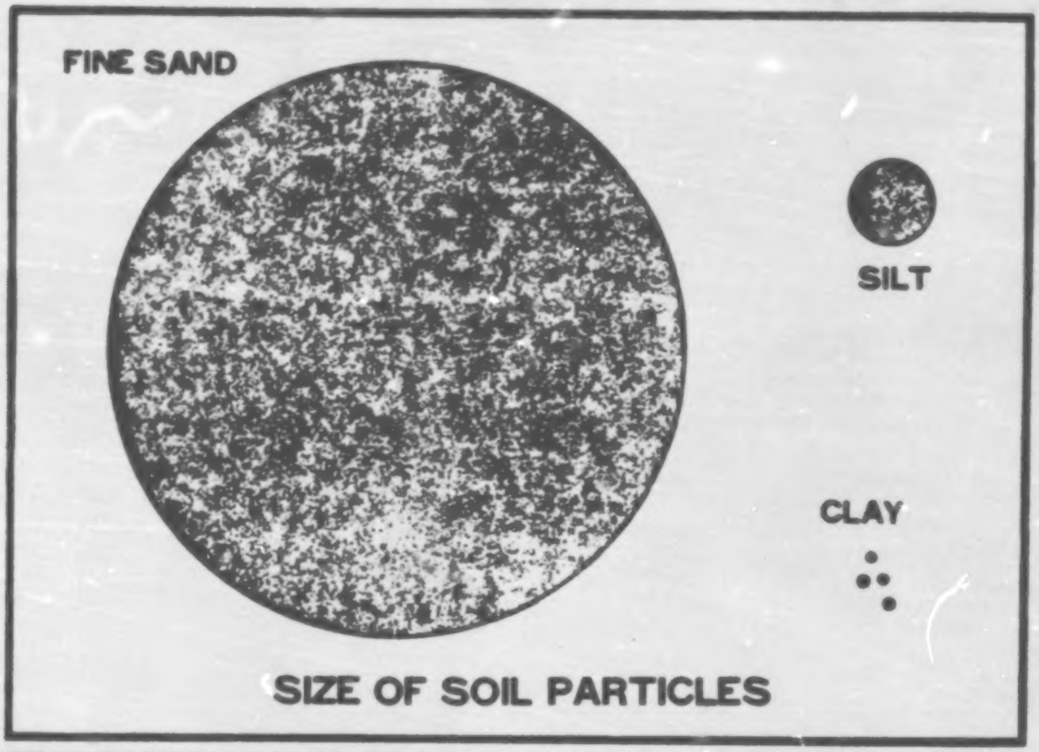
TRANSPARENCY II-1-B

Soil Triangle


100% CLAY
PERCENT CLAY
PERCENT SILT
PERCENT SAND
100% SAND
100% SILT
90
80
70
60
50
40
30
20
10
CLAY
SILTY CLAY
SANDY CLAY
CLAY LOAM
SILTY CLAY LOAM
SANDY CLAY LOAM
LOAM
SILT LOAM
SANDY LOAM
LOAMY SAND
SAND
SILT

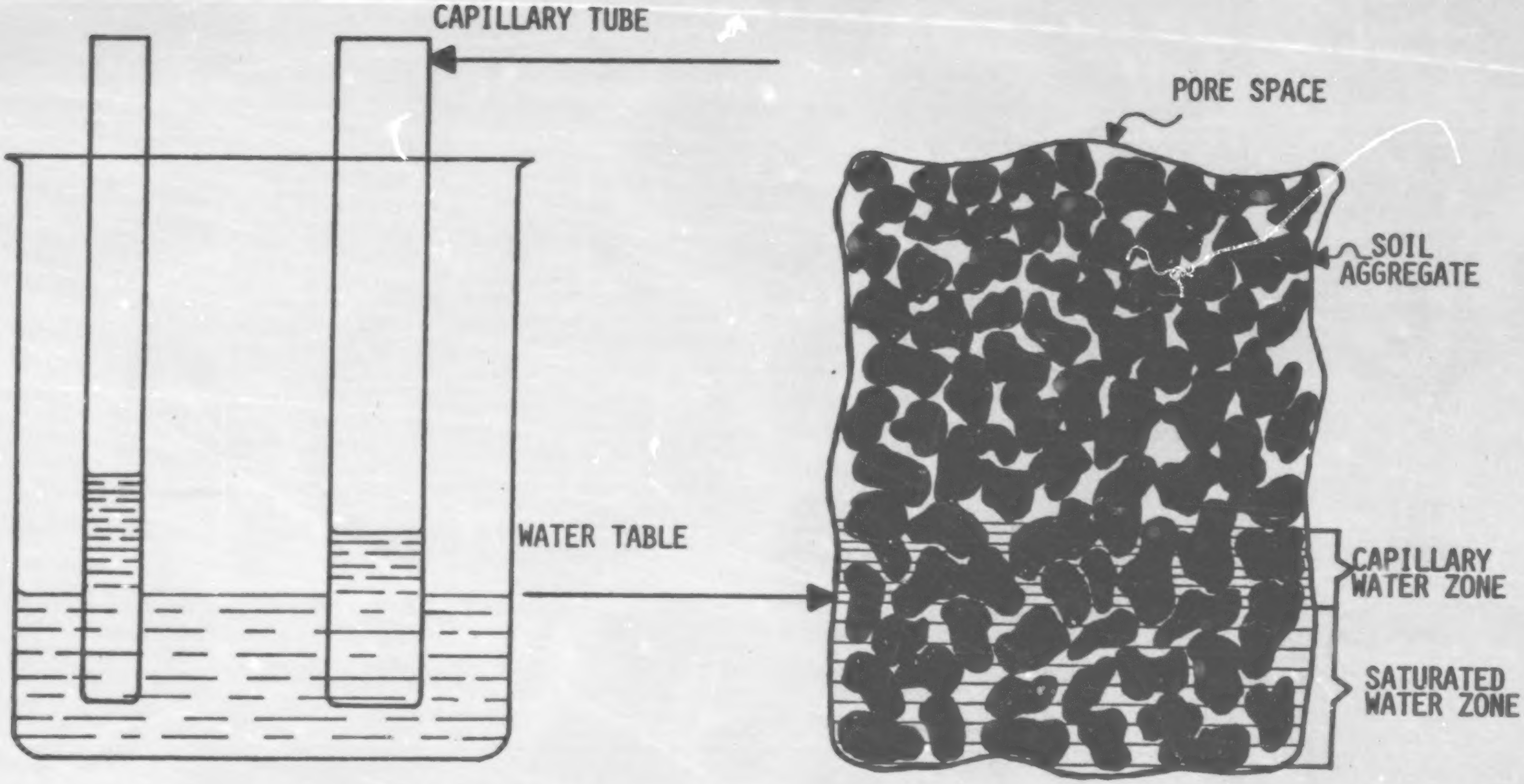
TRANSPARENCY II-1-C

THE RELATIVE SIZES OF SAND, SILT, AND CLAY PARTICLES


FINE SAND
SILT
CLAY
SIZE OF SOIL PARTICLES

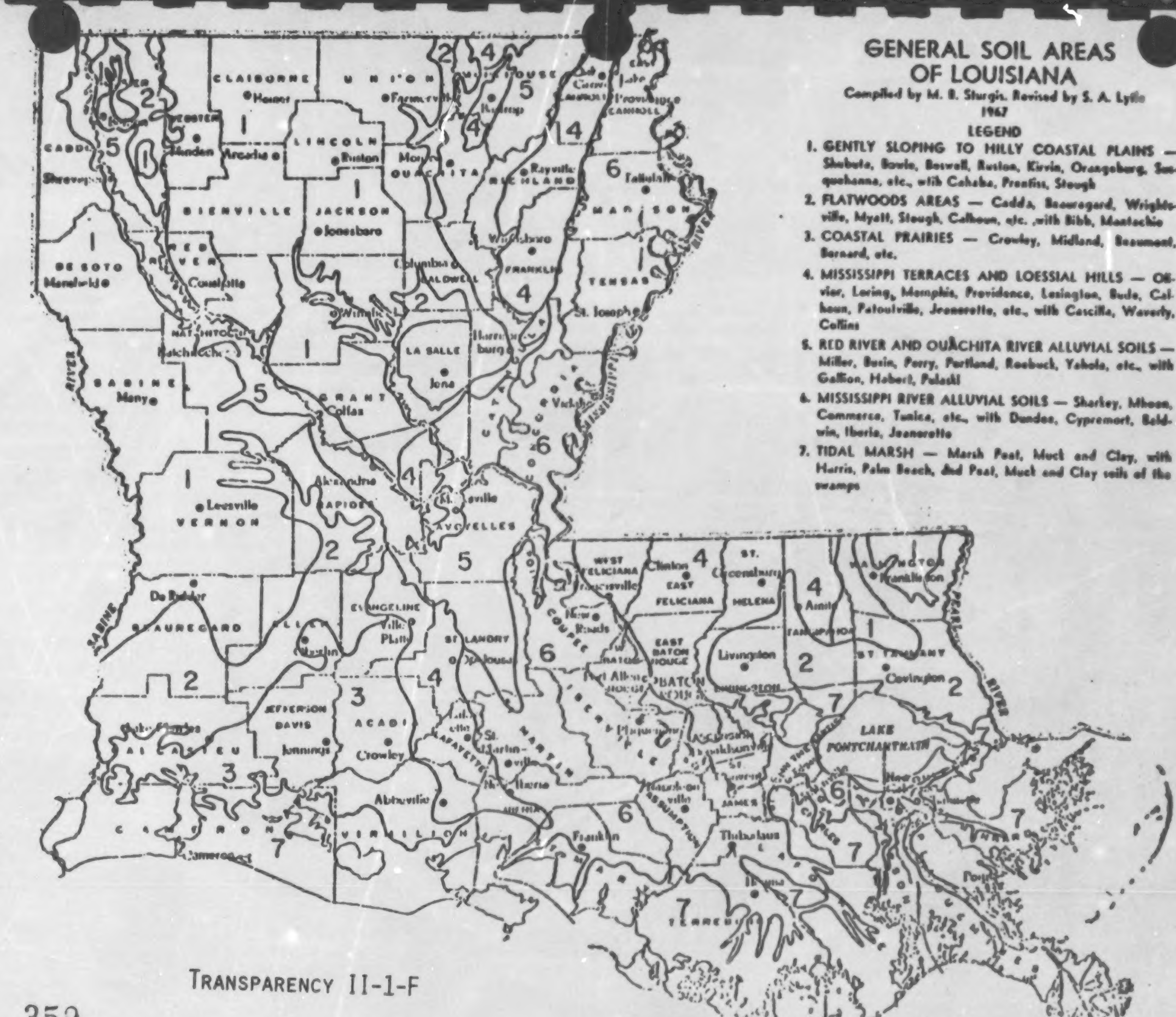
NAME	SIZE, DIAMETER IN MILLIMETERS
FINE GRAVEL	2 - 1
COARSE SAND	1.00 - 0.50
MEDIUM SAND	0.50 - 0.25
FINE SAND	0.25 - 0.10
VERY FINE SAND	0.10 - 0.05
SILT	0.05 - 0.002
CLAY	LESS THAN 0.002

TRANSPARENCY II-1-D


CAPILLARY TUBE
PORE SPACE
SOIL AGGREGATE
WATER TABLE
CAPILLARY WATER ZONE
SATURATED WATER ZONE

WATER MOVES UPWARD BETWEEN THE WALLS OF SMALL TUBES OR IN NARROW SOIL PORES BECAUSE OF CAPILLARY ATTRACTION

TRANSPARENCY II-1-E


CADDO
Shreveport
BOSSIER
WEBSTER
Minden
CLAIBORNE
Homer
UNION
Farmerville
MOREHOUSE
Bastrop
EAST CARROLL
Lake Providence
WEST CARROLL
LINCOLN
Ruston
Arcadia
BIENVILLE
JACKSON
Jonesboro
OUACHITA
Monroe
RICHLAND
Rayville
MADISON
Tallulah
DE SOTO
Mansfield
RED RIVER
Coushatta
CALDWELL
Columbia
FRANKLIN
Winnsboro
TENSAS
St. Joseph
NATCHITOCHES
Natchitoches
Winnfield
LA SALLE
Jena
CATAHOULA
Harrisonburg
SABINE
Many
GRANT
Colfax
CONCORDIA
Vidalia
MISSISSIPPI RIVER
SABINE RIVER
VERNON
Leesville
RAPIDES
Alexandria
AVOYELLES
Marksville
BEAUREGARD
De Ridder
ALLEN
Oberlin
EVANGELINE
Ville Platte
ST. LANDRY
Opelousas
POINTE COUPEE
New Roads
WEST FELICIANA
St. Francisville
EAST FELICIANA
Clinton
ST. HELENA
Greensburg
TANGIPAHOA
Amite
WASHINGTON
Franklinton
PEARL RIVER
EAST BATON ROUGE
WEST BATON ROUGE
Port Allen
Baton Rouge
LIVINGSTON
Livingston
ST. TAMMANY
Covington
LAKE PONTCHARTRAIN
CALCASIEU
Lake Charles
JEFFERSON DAVIS
Jennings
ACADIA
Crowley
LAFAYETTE
Lafayette
ST. MARTIN
St. Martinville
IBERVILLE
Plaquemine
ASCENSION
Donaldsonville
ASSUMPTION
Napoleonville
ST. JAMES
IBERIA
New Iberia
VERMILION
Abbeville
CAMERON
Cameron
ST. MARY
Franklin
LAFOURCHE
Thibodaux
TERREBONNE
Houma
ST. CHARLES
ST. BERNARD
PLAQUEMINES
New Orleans
1
2
3
4
5
6
7

GENERAL SOIL AREAS OF LOUISIANA

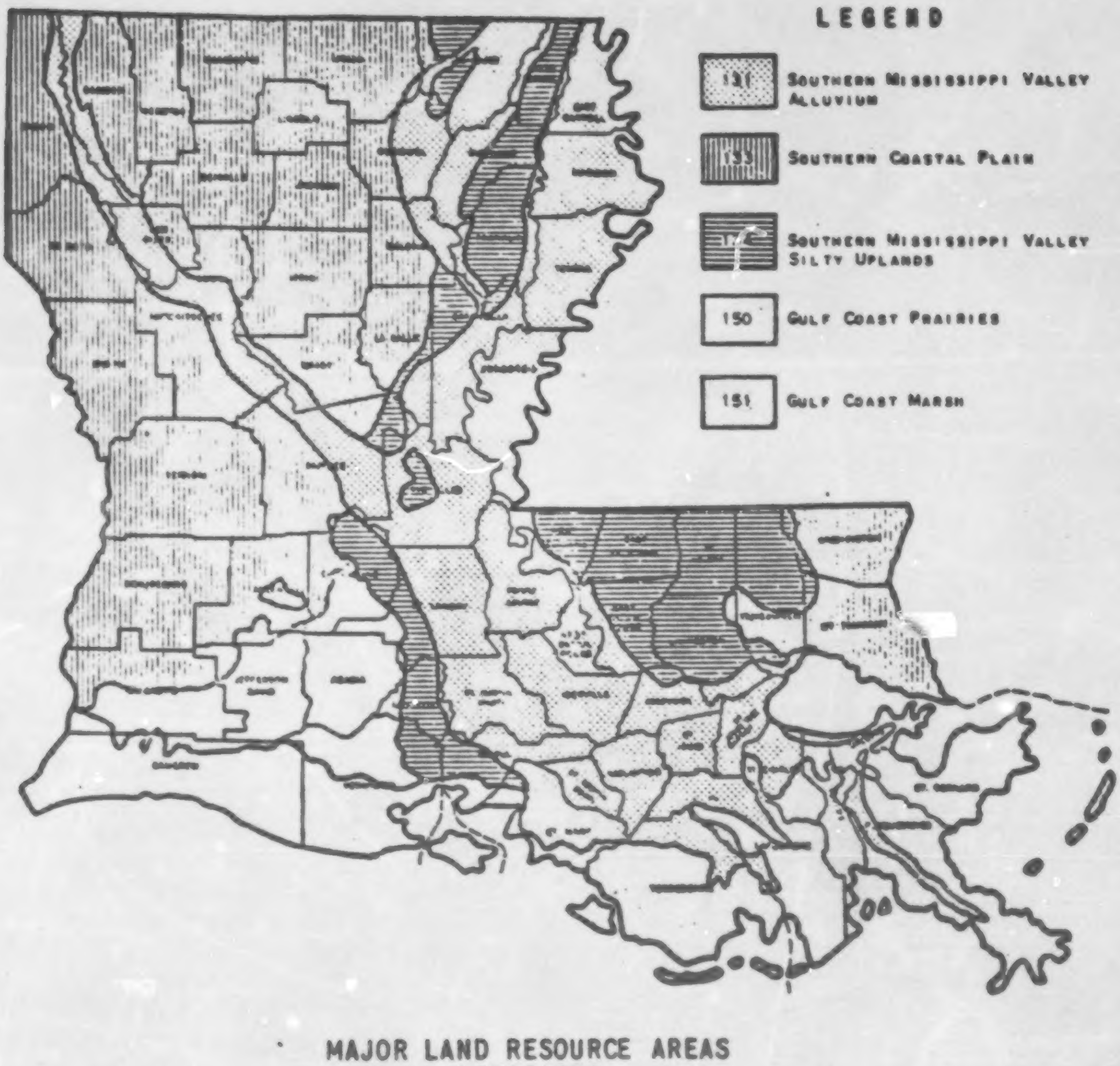
Compiled by M. B. Sturgis. Revised by S. A. Lytle

1967

LEGEND

1. GENTLY SLOPING TO HILLY COASTAL PLAINS — Shubuta, Bowie, Boswell, Ruston, Kirvin, Orangeburg, Susquehanna, etc., with Cahaba, Prentiss, Stough
2. FLATWOODS AREAS — Caddo, Beauregard, Wrightsville, Myatt, Stough, Calhoun, etc. ,with Bibb, Mantachie
3. COASTAL PRAIRIES — Crowley, Midland, Beaumont, Bernard, etc.
4. MISSISSIPPI TERRACES AND LOESSIAL HILLS — Olivier, Loring, Memphis, Providence, Lexington, Bude, Calhoun, Patoutville, Jeanerette, etc., with Cascilla, Waverly, Collins
5. RED RIVER AND OUÂCHITA RIVER ALLUVIAL SOILS — Miller, Busin, Perry, Portland, Roebuck, Yahola, etc., with Gallion, Hebert, Pulaski
6. MISSISSIPPI RIVER ALLUVIAL SOILS — Sharkey, Mhoon, Commerce, Tunica, etc., with Dundee, Cypremort, Baldwin, Iberia, Jeanerette
7. TIDAL MARSH — Marsh Peat, Muck and Clay, with Harris, Palm Beach, and Peat, Muck and Clay soils of the swamps

TRANSPARENCY II-1-F


LEGEND
131 Southern Mississippi Valley Alluvium
133 Southern Coastal Plain
134 Southern Mississippi Valley Silty Uplands
150 Gulf Coast Prairies
151 Gulf Coast Marsh

MAJOR LAND RESOURCE AREAS
LOUISIANA

0 50 100 150 Miles

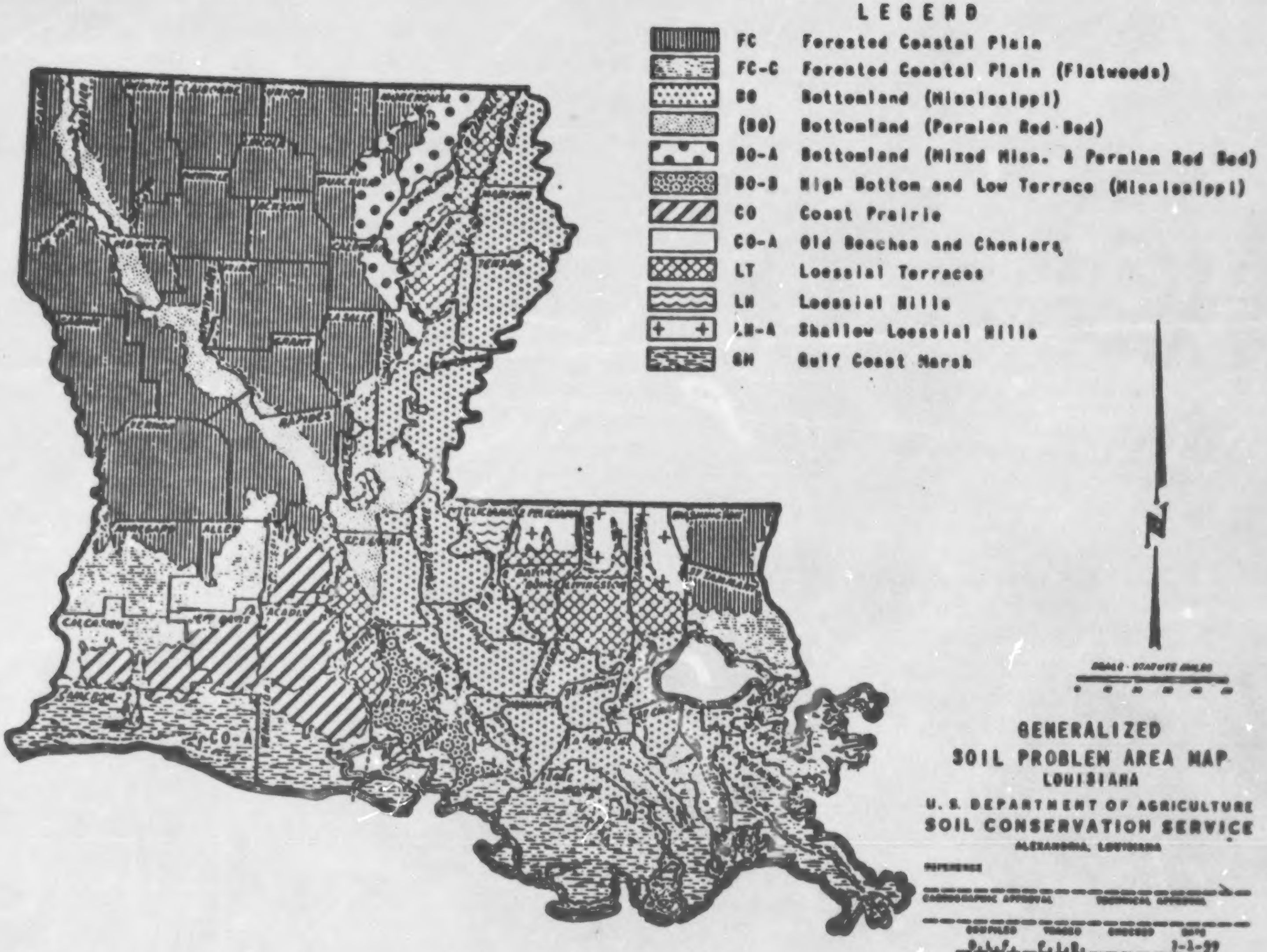
Reference Soils Memo SCS-49

7-64 4-L-19104

U. S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, Alexandria, Louisiana

Base 4-L-23779A

TRANSPARENCY II-1-G


LEGEND
FC Forested Coastal Plain
FC-C Forested Coastal Plain (Flatwoods)
BO Bottomland (Mississippi)
(BO) Bottomland (Permian Red Bed)
BO-A Bottomland (Mixed Miss. & Permian Red Bed)
BO-B High Bottom and Low Terrace (Mississippi)
CO Coast Prairie
CO-A Old Beaches and Cheniers
LT Loessial Terraces
LH Loessial Hills
LH-A Shallow Loessial Hills
GM Gulf Coast Marsh
CO-A
N
GENERALIZED
SOIL PROBLEM AREA MAP
LOUISIANA
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ALEXANDRIA, LOUISIANA
7-59 4-L-13560

TRANSPARENCY II-1-H

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT II: Soil Properties

LESSON 2: Chemical and Biological Properties of the Soil

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Explain the chemical and biological properties of the soil and how they affect plant production.

2. Specific:

a. List the chemical and biological properties of soils.
b. Explain how chemical and/or biological properties affect each other and how they affect the nature and conditions of the soil.
c. Name the microorganisms that are found in the soil.
d. List the soil microorganisms that are beneficial to farmers.
e. Describe the role of higher forms of plant and animal life in the soil.
f. Explain the effect of cation-exchange capacity on plant production.
g.

h.

B. Review Teaching Material

1. Donahue, Roy L., Roy H. Follett and Rodney W. Tulloch. Our Soils and Their Management. Danville: The Interstate Printers and Publishers, Inc., 1976.

2. Foth, H.D. and L.M. Turk. Fundamentals of Soil Science. 5th Edition, New York: John Wiley & Sons, Inc., 1972.

3. Kunti, Leo L. and Milton Korpi. Profitable Soil Management. Second Edition, Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1970.

C. Special Arrangement

1. Materials

   a. Soil auger

   b. Microscope

   c. Overhead projector

2. Travel

   Field tour to farms in the community to identify soil fauna (microscopic animals) and soil flora (microscopic plants).

II. Presentation of Lesson and Suggested Student Activities

A. Motivation

1. Examine and list those animals that can be seen with the naked eye in the soil.

2. Observe microorganisms of the soil under the microscope.

B. Content Outline

1. Terms

   a. Microorganisms -- forms of life too small to be seen with the unaided eye, or barely visible.

   b. Nematodes -- very small worms abundant in many soils and important because many of them attack and destroy plant roots.

   c. Nitrogen fixation -- the conversion of free nitrogen from the air into a form plants can use (NO_3 and NH_4).

   d. Organic matter -- the organic fraction of the soil. It includes plant and animal residues at various stages of decomposition.

   e. Fungus -- plant without chlorophyll that bear spores.

   f. Cation -- an ion carrying a positive charge of electricity. The common soil cations are calcium, magnesium, sodium, potassium, and hydrogen.

2. Chemical Properties of Soils

   a. Chemical properties of soils refer to arrangement, as well as types, of chemical compounds present.

      There are three forms of plant nutrients. (a) the unavailable; (b) the exchangeable, which is partly available; (c) the solution form, which is readily available.

      The unavailable form is the form in which the element is combined as a part of a compound and is not accessible to plant absorption until the compound is decomposed.

      The exchangeable form is the form in which the element exists as a cation on the surface of organic compounds or clay minerals. The exchangeable ions are available to plants.

The solution form is assumed to be the most available form. Soil water tends to dissolve some of all the ions with which it comes in contact.

b. The most important of these properties are:

1) Clay properties

   a) Clay holds soil nutrients, determines acidity of the soil and holds more moisture than sand or silt.

   b) The types of clay found in soils are kaolintic and montmorillonitic.

2) Cation exchange capacity -- exchange capacity of soils is affected by both the type and amount of clay, as well as the amount of organic matter and lime present. The process whereby positively charged ions of one kind are replaced on the surface of the clay-organic colloidal material is called cation exchange. The cation-exchange capacity of a soil depends on the amounts and kinds of finely divided mineral and organic particles present. Sandy soils generally have low cation-exchange capacities. Clay in a soil has a greater capacity for holding cations than does sand because porous sandy soils leach readily and are more likely to be acid than are heavy soils under the same condition. Organic matter increases the cation-exchange capacity in the soil.

3) pH (acidity or alkalinity) (Transparencies II-2-A&B) -- this is influenced by the proportion of the cation-exchange capacity which is occupied by the (H^+) ion. The more (H^+) ions, the lower the pH and the more acidic the soil

becomes. The more (oH^-) ions, the higher the pH and the more basic the soil becomes.

a) The pH is a numerical designation of acidity and alkalinity in soils. (See Unit III, Lesson I)

b) The acidity or alkalinity of the soil solution is determined by the relative number of the hydrogen ions (H^+) and hydroxl ions (oH^-).

Changes in the acidity of soils may change the availability to plants of different nutrients in different ways. As the pH of an acid soil is increased by the addition of lime, ions such as aluminum, iron, manganese, copper, and zinc become less soluble. In acid soils these ions may be found in dissolved form in quantities sufficient to become toxic to plants.

c) Most soils in Louisiana are acid in their natural state.

c. The chemical properties of soils may be improved by the proper use of lime, humus, and commercial fertilizers. (See Unit III, Lesson 2)

When lime is added to the soil, the calcium ions in calcium hydroxide from the lime replace some of the hydrogen ions, resulting in a neutral clay particle. This forms water molecules. When this occurs, the soil becomes less acidic and more alkaline. Humus provides a storehouse for exchangeable and available cations such as potassium and magnesium. In addition, commercial fertilizer affects this through adding important nutrients for plant growth, because more vegetation is produced, the organic matter content increases. Liming also assists in the decay of organic matter and the liberation of plant foods.

d. Competition for Plant Nutrients

1) Loss of free nitrogen -- when oxygen is deficient, microbes break down the nitrogenous material into ammonia or gaseous nitrogen which escapes from the soil.

2) Nitrogen "tie-up" -- soil microorganisms draw upon the soil nitrogen to balance their diets; thus, the available soil nitrogen is "tied-up" in the tiny bodies of the microbes.

e. Higher forms of animal life in the soil

1) Slugs, snails, and cutworms -- attack growing plants when food is scarce.

2) Nematodes -- some puncture roots of plants and prepare for the entrance of other parasites.

3) Arthropods -- ants, centipedes, mites, etc. Most feed on decaying organic material.

4) Earthworms -- important soil builders and conditioners.

5) Soil rodents -- activities include soil pulverization, granulation, and mixing. Their burrows permit moisture to penetrate deeper into the soil. Examples are gophers, ground squirrels, woodchucks.

f. Higher forms of plant life in the soil

Plant decay is an important source of soil organic matter. Decaying roots also add minerals, air, and water to the soil.

Nitrogen, phosphorus, and sulfur readily enter into organic combination, and they are stored in the soil in organic matter.

3. Biological Properties of the Soil (Transparency II-2-C)

   a. Biological properties are related to organisms present.

   b. The large animals in soils, for example, insects and earthworms, are important for mixing the soil materials.

   c. Microscopic soil inhabitants such as bacteria and fungi generally feed on plant materials, transforming them into new materials.

   Bacteria and micro-organisms living in the soil convert nitrogen, sulfur, and phosphorus from organic compounds, in which these nutrients are unavailable to plants, to simpler inorganic forms that plants can take up. Neutralizing an acid soil usually makes the soil condition more favorable to the growth of bacteria and may thus indirectly speed up processes by which important nutrients become available to plants.

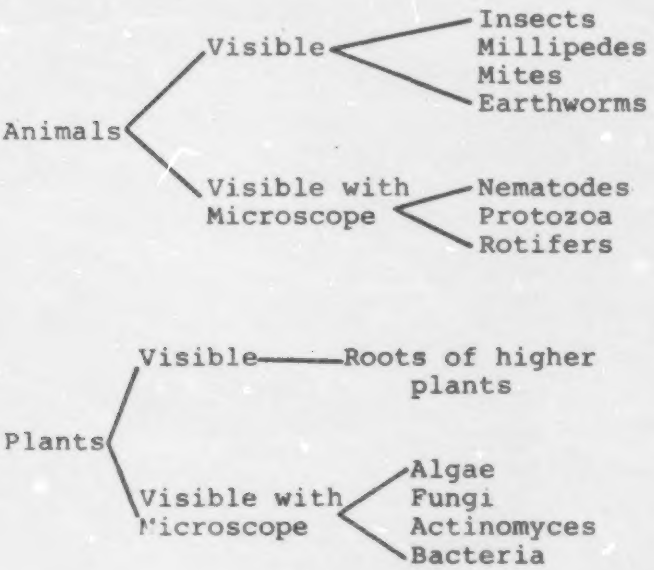

Animals
Visible
Insects
Millipedes
Mites
Earthworms
Visible with Microscope
Nematodes
Protozoa
Rotifers
Plants
Visible
Roots of higher plants
Visible with Microscope
Algae
Fungi
Actinomyces
Bacteria

Figure I: The more important groups of organisms found in the soils.

4. How Soil Microorganisms Help Farmers
    a. Decay of plant residue
    b. Conversion of free nitrogen in air to forms available to plants
    c. Wonder drugs such as penicillin and streptomycin are produced by soil microorganisms
    d. Aiding soil tilth, by-products of bacteria, fungi, and actinomycytis, cement soil grains together, thus improving aggregation

C. Suggested Student Activities

1. Identify as many of the larger animals in the soil sample as possible.
2. Observe microorganisms of the soil under the microscope.
3. Discuss what farm practices of the community are beneficial to soil organisms. Which are harmful?
4. Visit fields where the effects of soil microorganisms can be studied; observe soil tilth and plant residue decay.

D. Suggested Study Questions

1. What is included in the chemical properties of soil?
2. What is pH?
3. Are most soils in Louisiana acid or alkaline?
4. How do soil organisms affect the condition of the soil?
5. Give examples of some higher forms of animal life in the soil.
6. Give examples of some higher forms of plant life in the soil.
7. What are some harmful effects of soil organisms?

8. What are some benefits of soil organisms?

9. How does the cation-exchange capacity of soils affect plant production?

10.

11.

12.

13.

ION EXCHANGE OF SOIL PARTICLES

FIGURE 1:
MINERAL NUTRIENTS HELD ON THE SURFACE OF A SOIL PARTICLE ARE ABSORBED

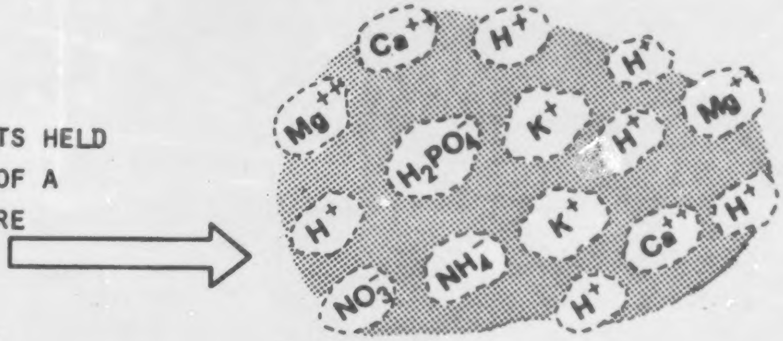

Ca^{++}
H^+
H^+
Mg^{++}
H_2PO_4
K^+
H^+
Mg^{++}
H^+
K^+
Ca^{++}
H^+
NO_3^-
NH_4^-
H^+

FIGURE 2:
A SOIL PARTICLE WITH MOSTLY HYDROGEN IONS TESTS ACID

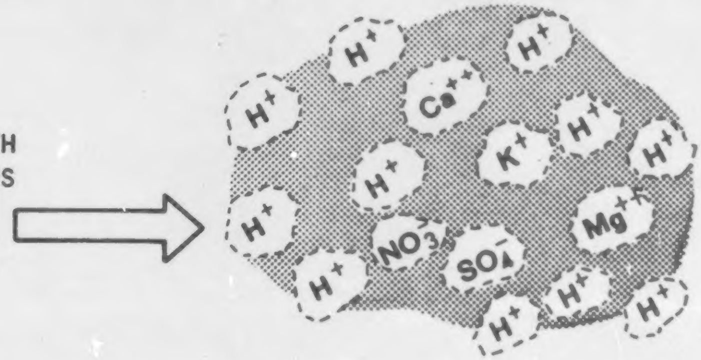
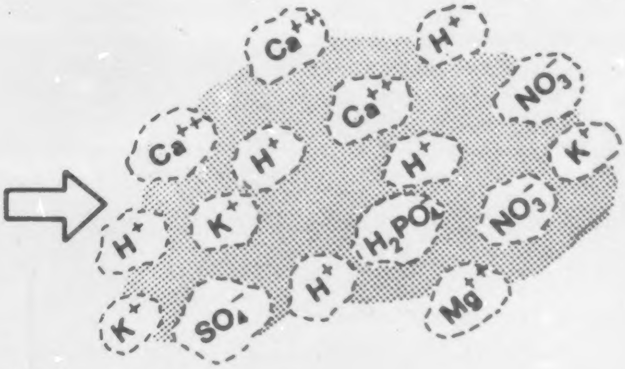
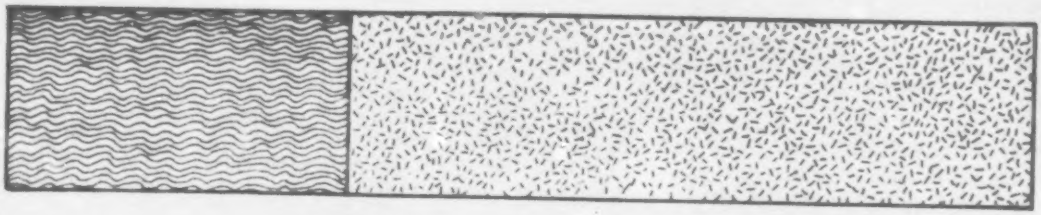

H^+
H^+
H^+
Ca^{++}
H^+
K^+
H^+
H^+
H^+
NO_3^-
SO_4^-
Mg^{++}
H^+
H^+
H^+
H^+

FIGURE 3:
A SOIL PARTICLE WITH MOSTLY BASIC IONS TESTS ALKALINE


Ca^{++}
H^+
NO_3^-
Ca^{++}
Ca^{++}
H^+
H^+
K^+
H^+
K^+
H_2PO_4
NO_3^-
K^+
SO_4^-
H^+
Mg^{++}

BASIC CONSTITUENTS OF A SOIL SOLUTION

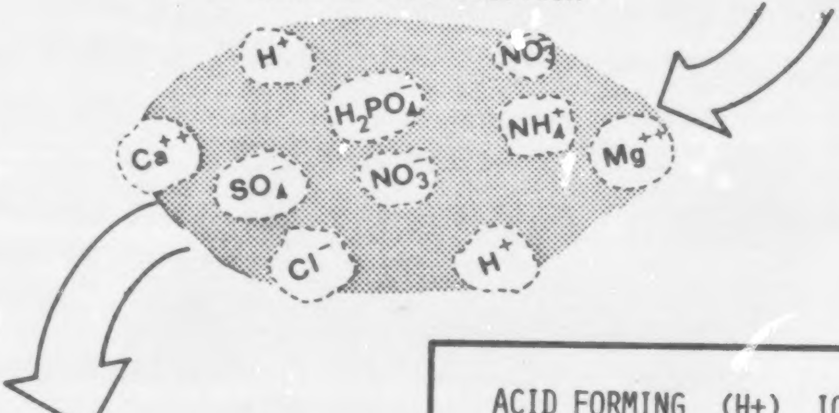


WATER PLUS DISSOLVED PLANT NUTRIENTS

OR

H_2O + (H+) (OH-) IONS

A NUETRAL SOIL SOLUTION


H^+
NO_3^-
$H_2PO_4^-$
NH_4^+
Ca^{++}
Mg^{++}
SO_4^-
NO_3^-
Cl^-
H^+

EQUAL NUMBER OF —

ACID FORMING (H+) IONS

AND

HYDROXYL (OH-) IONS (BASIC)

- ANIMALS
  - VISIBLE
    - INSECTS
    - MILLIPEDES
    - MITES
    - EARTHWORMS
  - VISIBLE WITH MICROSCOPE
    - NEMATODES
    - PROTOZOA
    - ROTIFERS
- PLANTS
  - VISIBLE
    - ROOTS OF HIGHER PLANTS
  - VISIBLE WITH MICROSCOPE
    - ALGAE
    - FUNGI
    - ACTINOMYCES
    - BACTERIA

THE MOST IMPORTANT GROUPS OF ORGANISMS
COMMONLY FOUND IN SOILS

TRANSPARENCY II-2-C

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT III: Soil Acidity and Liming

LESSON 1: Soil Acidity and Alkalinity

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Discuss the relationship of soil alkalinity and soil acidity and how this affects suitability of soils for growing different crops.

2. Specific:

a. Make a large chart of the pH scale to show degrees of soil acidity and alkalinity.
b. Make laboratory tests for acidity of common products such as fresh milk, sour milk, orange juice, and lemon juice. (Transparency III-1-A)
c. Explain how calcium affects soil acidity and the availability of other elements.
d. Explain how pH symbols are used in denoting the degree of acidity and alkalinity in soils.
e. Describe the conditions that lead to soil acidity or alkalinity.
f. List the pH ranges of the major crops.
g.

h.

i.

B. Review Teaching Material

1. Foth, H.D. and L.M. Turk. Fundamentals of Soil Science. 5th Edition, New York: John Wiley & Sons, Inc., 1972.

2. Knuti, Leo L., Milton Korpi and J.C. Hide. Profitable Soil Management. 2nd Edition, Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1970.

3. Donahue, Roy L., Roy H. Follett and Rodney W. Tulloch. Our Soils and Their Management. Danville: Interstate Printers and Publishers, Inc., 1976.

4. McVickar, Malcolm H. and William Walker. Using Commercial Fertilizers. 4th Edition, Danville: Interstate Publishers, 1978.

C. Special Arrangements

1. Materials needed

   a. pH meter

   b. pH indicator solution (either Brom cresol green or Brom thymol blue or Brom thymol purple) (Sudsbury Soil Testing Kit)

   c. Spot plates

   d. A small amount of dilute sulphuric or hydrochloric acid or vinegar and a basic material such as soap powder.

   e. Soil samples that have high and low pH's (check soil testing service)

   f. Two or more soil samples (Transparency III-1-C)

   g. Soil auger or probe

2. Audio-visual equipment

   a. Overhead projector

   b. Transparency of pH scale

II. Presentation of Lesson and Suggested Student Activities

A. Motivation

1. Test soil samples around school community using pH indicator dye or solution and pH color chart. 42

2. Observe how pH of a soil sample is determined in the laboratory by use of a pH meter.

B. Content Outline

1. Definition of terms

   a. Soil acidity -- refers to the relative proportion of basic elements such as calcium, magnesium, and potassium present in relation to the acidic hydrogen and aluminum.

   b. pH -- a numerical value between 0 and 14 used to indicate the degree of acidity or alkaline range; those below 7 are in the acid range. (Transparency III-1-B)

   c. pH indicator -- a chemical substance that develops a characteristic color depending on the acidity or alkalinity of a soil.

   d. Leaching -- the process of removal of soluble salts from soils by the passage of water through the soil.

2. Expressing soil acidity and alkalinity

   a. Soil scientists speak of soil acidity and alkalinity as reaction. Soil reaction is expressed in pH value. The "p" of the symbol refers to "pressure" and the "H" refers to hydrogen ions. Thus, "pH" refers to the pressure or concentration of hydrogen ions.

   b. Freshly distilled water is neutral and typifies the balance of hydrogen ions and hydroxyl ions in the soil solution.

   c. An alkaline soil is one that contains an excess of hydroxyl ions over hydrogen ions in the soil solution.

   d. An acid soil is one which contains an excess of hydrogen ions over hydroyxl ions.

   e. In soils with a balance of hydrogen and hydroxyl ions, the pH is 7, or neutral.

   f. Soils which are slightly acid have the acidity of fresh milk, or pH 6.6 - 6.9.

    g. Soils that are strongly acid have an acidity of sour milk, or pH 4.6 - 4.8. 44

    h. Extremely acidic soils have the acidity of lemon juice, or pH 2.2 - 2.6.

    i. Soils that are weakly alkaline have the alkalinity of human blood, pH 7.35.

    j. Soils that are weakly alkaline to alkaline have the alkalinity of sea water, pH 7.5 - 8.4.

    k. Soils that are strongly alkaline have the alkalinity of a soap solution, pH 8.0 - 10.0.

    l. A pH of 5.0 indicates 10 times more acidity than at 6.0, while a pH of 4.0 reflects an additional 10 fold increase or 100 times the acidity of pH 6.0.

3. Causes of soil acidity

    a. In humid regions such as Louisiana, there is much water moving through the soils.

    b. As this water moves through the soil, it combines with carbon dioxide.

    c. This gas and water unite to form a weak acid (carbonic acid).

    d. Under heavy rainfall, this weak acid leaches the lime out of the soil.

    e. The leaching of soils by rain gradually removes calcium and other bases, and the soils become acid.

    f. Soils in areas with high rainfall are usually acid.

    g. When plant growth is removed from the land as in harvesting, the basic ions the plant removes from the soil are lost from the soil rather than returned through processes of decay. This also tends to make the soil acid.

4. Range of reactions of soils

   a. The usual pH range of soils in humid areas is from pH 5.0 to pH 6.0. This is described as an "acid to weakly acid range."

   b. Rarely do soils have a pH 4.0, which is considered strongly acid.

5. Seasonal variation in acidity -- soils increase slightly in acidity during the summer.

6. Reaction and plant growth -- generally, crops favor a slightly acid soil. Crops that thrive best on strongly acid soils include the blueberry, watermelon, and azaleas.

Weakly Acid Soil (6.1 - 6.5)	Moderately Acid Soil (5.6 - 6.0)	Acid Soil (5.1 - 5.5)
alfalfa	soy beans	kudzu
sweet corn	cotton	crimson clover
cabbage	peanuts	corn
lettuce	carrots	tobacco
onions	sweet corn	sorghum
spinach	tomatoes	millet
asparagus	turnips	strawberry
millet	radishes	sweet potatoes
redtop clover		potatoes

The soil pH of greatest availability of plant nutrients is about 6.5 for mineral soils and about 5.5 for organic soils.

C. Suggested Student Activities

1. Draw a pH scale and indicate what points on the scale would be neutral, acid, or alkaline.

2. Interpret the pH of soil samples using pH indicator, dye solution, and pH color chart.

3. Observe how pH of a soil sample is determined in the laboratory by use of a pH meter.

4. Have students collect soil samples for state laboratory testing. 46

D. Suggested Study Questions

1. Define pH.
2. What is soil acidity?
3. How does acidity affect crop production?
4. What is alkalinity?
5. How does alkalinity affect crop production?
6. Name the factors that affect soil pH.
7. How does leaching affect alkaline soils over a period of years?
8. List five crops that grow best in acid soils.
9. List five crops that grow best in alkaline soils.

47 Suggested practical exercise.

1. Title -- measuring soil acidity.

2. Objective -- to develop an understanding of soil acidity of pH and how it can be measured.

3. Materials
   a) pH indicator solutions
   b) color chart
   c) spot plates
   d) dilute acid (acetic or clear vinegar)
   e) basic material (soap powder)
   f) soil samples of high and low pH
   g) soil samples from around school

4. Procedure

Prepare two dilute solutions, one acid and one basic. Next, measure small amounts of each solution into wells of a spot-plate. Add a few drops of the indicator. After a few minutes, compare the color with the appropriate chart for each indicator.

After you have observed color differences, use a soil sample in place of the acid or basic solution. Add enough indicator, drop by drop, to wet the sample. Compare color with chart.

MR. FARMER, PLEASE READ CAREFULLY: Chemical analysis of this soil is only a guide to soil productivity. The above information is a guide in making fertilizer recommendations. When you have indicated the yields which you hope to make, the recommendations which you receive will be based upon the assumption that you will give the crop a high level of management, that all other production practices will be in accordance with the recommendations of the County Agent and that the rainfall for the year will be about normal.

Name below the crop to be grown and yield you wish to make.

Crop to be grown.	Yield desired.
soybeans	30 bushels

FOR USE OF SOIL LAB ONLY

RESULTS OF THE SOIL TEST:

SURFACE SOIL

	ANALYSIS	VERY LOW	LOW	MEDIUM	HIGH
Extractable Phosphorus (P), ppm					
Extractable Potassium (K), ppm					
Extractable Calcium (Ca), ppm					
Extractable Magnesium (Mg), ppm					
Soil Reaction (pH)					
Organic Matter, %					
Water Soluble Salts, ppm					
Other Analysis					

Lime effects on pH: Amount of Lime Per Acre to increase the soil to the following pH values.

1 Ton ______________ 2 Tons ______________ 3 Tons ______________ 4 Tons ______________

Laboratory Sample Number ________

COOPERATIVE EXTENSION SERVICE

Louisiana State University and A & M
College and United States Department
of Agriculture Cooperating

BE SURE YOU TAKE A GOOD SAMPLE. SEE YOUR COUNTY AGENT FOR INSTRUCTIONS.

SOIL TEST INFORMATION SHEET

Soil Testing Laboratory, Department of Agronomy
Louisiana Agricultural Experiment Station, Baton Rouge, La. 70803

________ Signature of County Agent or others who took or mailed sample ________ Title ________ Mailing Address ________ Zip Code

________ Date

Soil Texture ________
(For Laboratory use only)

THE FOLLOWING INFORMATION MUST ACCOMPANY EACH SAMPLE OF SOIL.

1. Name of landowner John Smith 3232 Smith Lane Baton Rouge, La. Mailing Address
2. Field Identification #1 Parish East Baton Rouge
3. Position of land is: (check) Bottom X Upland ____ Terrace ____ Other ____
4. The land is: (check) Hilly ____ Rolling ____ Flat X Depressed ____
5. The internal (subsoil) drainage is: Excessive ____ Good X Fair ____ Poor ____
6. Depth to which soil was sampled 4 inches
7. Write in the spaces below the crops grown in the past three years.

Soybeans	Rice	Soybeans
1979	1980	1981

8. What kind and how much fertilizer and lime did you use in the past three years on this field?

1979 Used 0-15-20

1980 Used 10-20-10

1981 Used 5-20-10

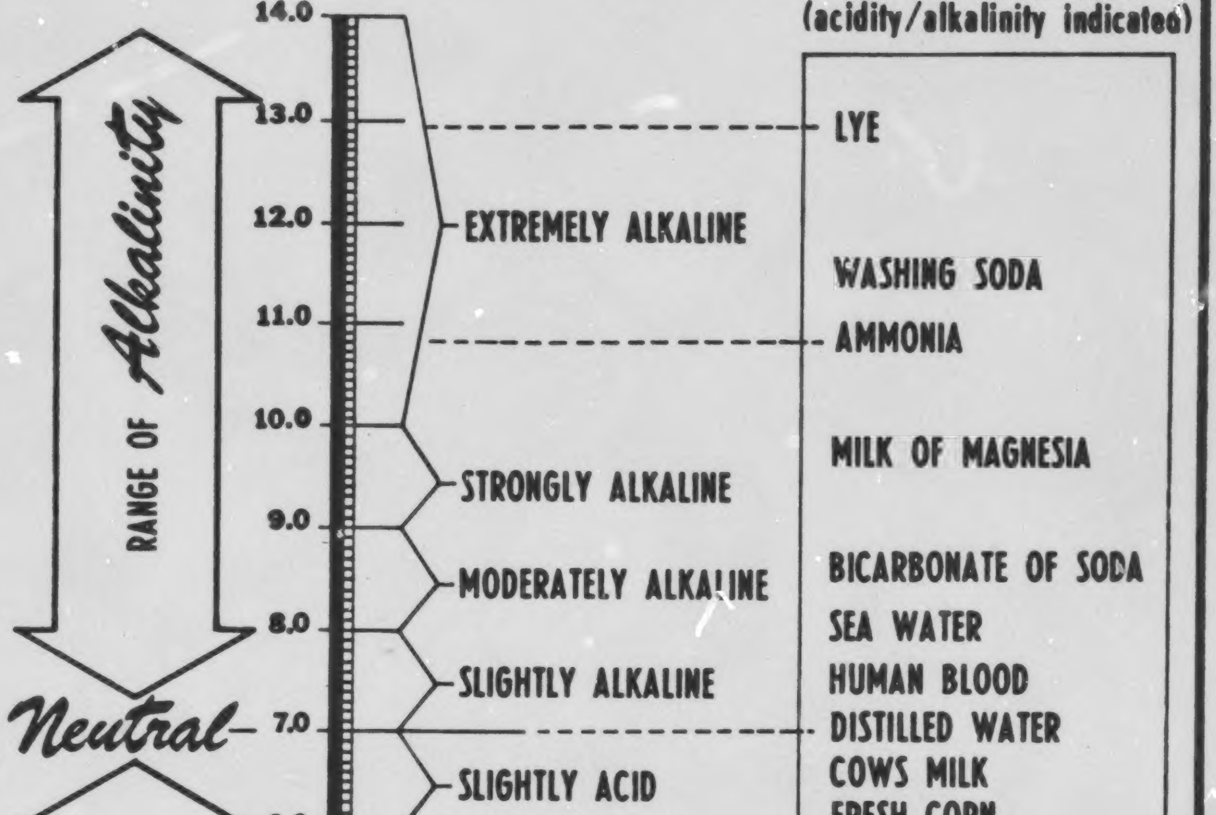
9. What yields did you make in this field in these years?

1979 18 bushels/acre 1980 100 bushels/acre 1981 20 bushels/acre

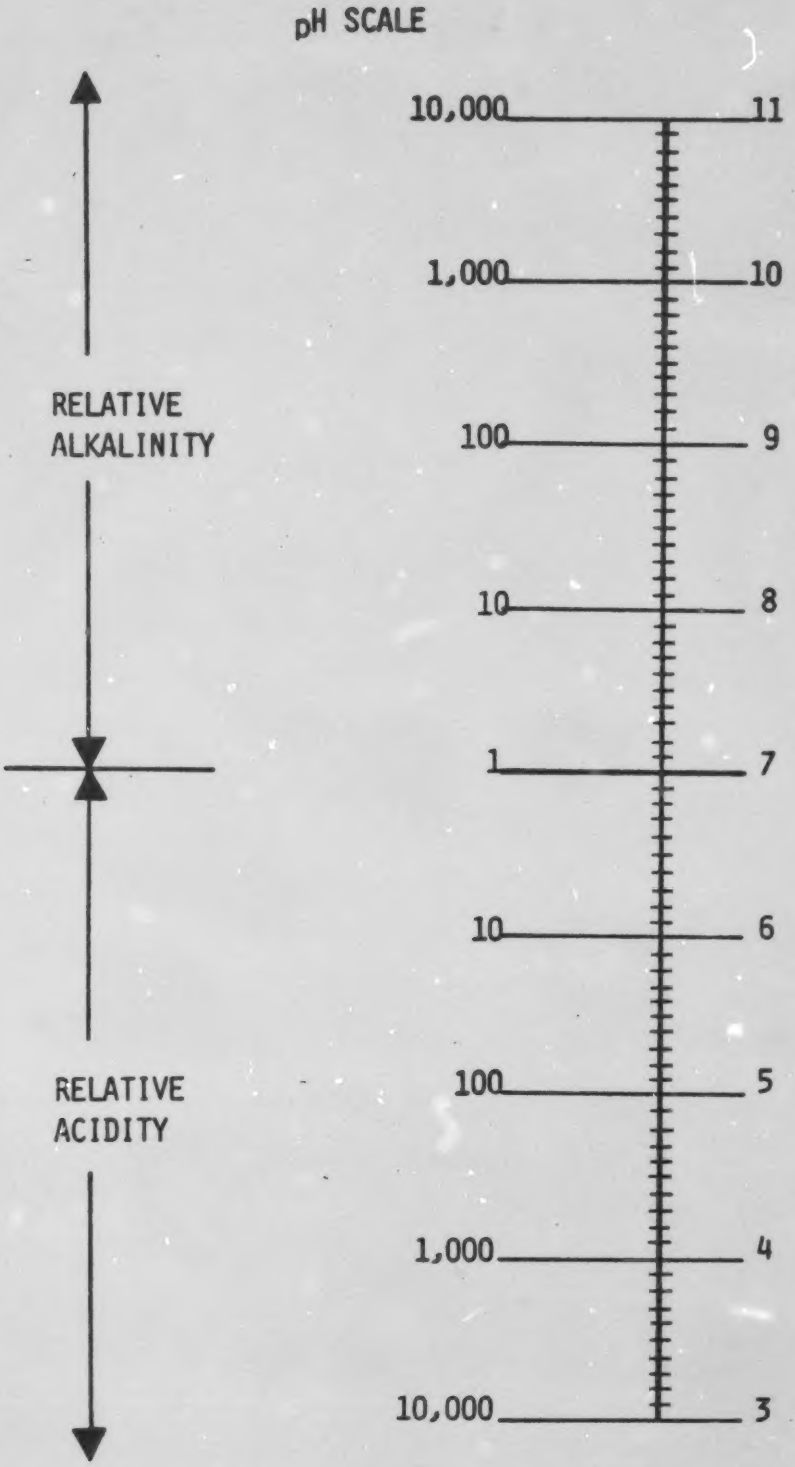
10. What problems seem to be affecting production on this land? nematodes in soybeans
11. What acreage does this sample represent? (Number of acres) 40 acres

(over)

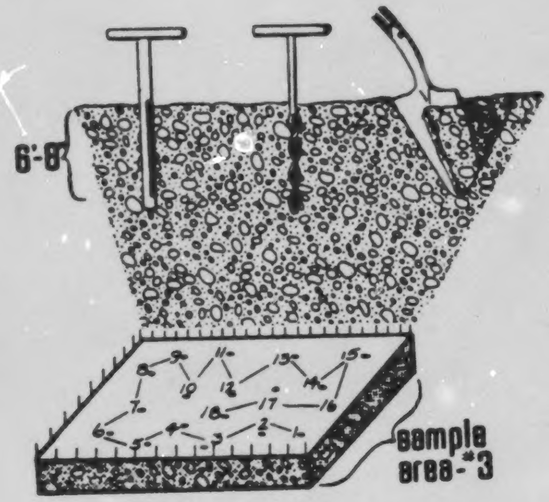
pH SCALE


FAMILIAR PRODUCTS
(acidity/alkalinity indicated)
RANGE OF Alkalinity
Neutral
RANGE OF Acidity
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
.0
EXTREMELY ALKALINE
STRONGLY ALKALINE
MODERATELY ALKALINE
SLIGHTLY ALKALINE
SLIGHTLY ACID
MODERATELY ACID
STRONGLY ACID
EXTREMELY ACID
LYE
WASHING SODA
AMMONIA
MILK OF MAGNESIA
BICARBONATE OF SODA
SEA WATER
HUMAN BLOOD
DISTILLED WATER
COWS MILK
FRESH CORN
FRESH BEANS
BORIC ACID
TOMATOES
APPLES
GRAPEFRUIT
VINEGAR
LEMONS
PHOSPHORIC ACID

TRANSPARENCY III-1-A

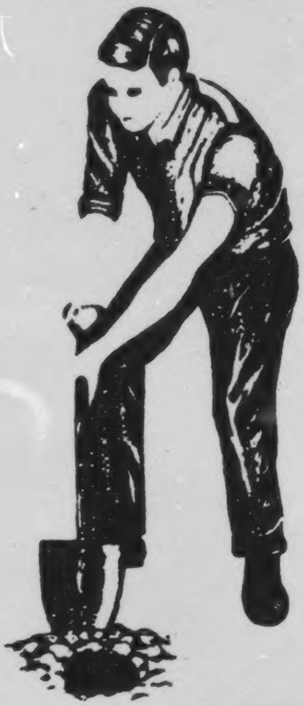

pH SCALE
RELATIVE ALKALINITY
RELATIVE ACIDITY
10,000
1,000
100
10
1
10
100
1,000
10,000
11
10
9
8
7
6
5
4
3

RELATIVE ACIDITY AND ALKALINITY
TRANSPARENCY III-1-B


6"-8"
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
sample
area-#3

TAKE SOIL TO PLOW DEPTH FROM AT LEAST 15 SPOTS FOR EACH SAMPLE AREA

IF SPADE IS USED, SAVE SOIL FROM MIDDLE OF SLICE



TRANSPARENCY III-1-D

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT III: Soil Acidity and Liming

LESSON 2: Liming to Correct Soil Acidity

I. Preparation for Instruction

  A. Student Objectives

    1. Terminal: Explain how lime reduces soil acidity and list the sources of lime and the factors of concern before applying lime.

    2. Specific:

      a. List some of the benefits obtained from liming a soil.
      b. List the steps involved in liming acid soils used for growing plants.
      c. Explain how lime reduces soil acidity.
      d. Describe briefly how you would determine the lime requirement for a specific crop.
      e. Identify different kinds of lime materials.
      f. Describe the appearance of plants growing in soils of different pH levels.
      g. List some of the sources of commercial lime.
      h. Describe the different methods of applying lime and the type of equipment used.
      i. Formulate a liming schedule for various crops.
      j.
      k.
      l.

B. Review Teaching Materials

1. Donahue, Roy L. et al. Our Soils and Their Management. Fourth Edition, Danville: Interstate Publishers, 1976.

2. Knuti, Leo L., et al. Profitable Soil Management. Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1970.

3. McVickar, Malcolm H. and William M. Walker. Using Commercial Fertilizers. Fourth Edition, Danville: Interstate Publishers, 1978.

C. Special Arrangements

1. Travel

   Field tours to farms to observe liming procedure.

2. Materials

   a. Sandy soil

   b. Clay or high organic matter soil

   c. Alfalfa, clover, or soybean seed

   d. Liming material

   e. Fertilizer

   f. Containers

3. You need several containers of at least one-pint capacity, a teaspoon, a piece of canvas or heavy paper, and a supply of water.

II. Presentation of Lesson and Suggested Student Activities

A. Motivation

1. Field tour of farms to observe the application of lime.

2. Field tours to farms to observe plants growing on inadequately limed soil.

3. How to take samples of soil to determine amount of lime needed. (Transparencies III-2-A,B,C,D,E,F&G)

B. Content Outline

1. Definition of Terms

   a. Lime -- a material whose calcium and magnesium content is capable of neutralizing soil acidity. Most agricultural lime is calcium carbonate or a mixture of calcium and magnesium carbonate.

   b. Chlorosis -- a condition in plants resulting from the failure of chlorophyll to develop, usually because of deficiency of an essential nutrient which may be caused by improper pH levels. This condition causes yellowing of green portions of a plant, particularly the leaves.

   c. Nitrogen fixation -- the conversion of free nitrogen in the air by nitrogen-fixing bacteria found in the root nodules of leguminous plants.

   d. Leaching -- the process of removal of soluble salts from soils by the passage of water through the soil.

   e. Sedimentary rock -- a rock largely composed of sediments; the chief sedimentary rocks are sandstone, shale, limestone, and conglomerate.

   f. Limestone -- a sedimentary rock that contains impure calcium carbonate or a mixture of calcium and magnesium carbonate.

   g. Soil tilth -- the physical condition of a soil in respect to its fitness for the growth of a specific plants or sequence of plants.

2. The Benefits Derived from Liming

   a. It helps to neutralize the acidity in soils and brings the pH level to that of a less acid condition.

   b. Makes available molybdenum which becomes unavailable under acid conditions. It is essential for the conversion of ammonium to nitrate nitrogen that becomes available to all plants.

c. Increases the availability of phosphorus, especially in soils that contain large amounts of iron and aluminum; phosphates are increased as acidity is reduced.

d. Decreases the tendency for potassium to be lost by leaching.

e. Supplies calcium and magnesium which are nutrients essential for plant growth.

f. Lime on acid clays increases desirable soil structure. It breaks down clay and makes it more open, friable, and tillable.

g. Lime encourages more plant growth, more plant residue, and therefore, more soil organic matter to "lighten" a clay soil which makes it easier to till and keeps it in good tilth.

3. Forms of Lime

   a. Almost all lime used on acid soils consists of finely ground limestone.

   b. Limestone occurs in nature as a sedimentary rock composed of mostly calcuim carbonate.

   c. Two of the more common liming materials used in Louisiana are:

      1. Agricultural or ground dolomitic limestone.

      2. Hydrated lime (calcium oxide).

4. Effects of too Much Lime -- too much lime on any soil may cause the following:

   a. Plants may be chlorotic (yellow or white) due to iron deficiency.

   b. Zinc, copper, manganese, and boron may become less soluble and less available to plants.

c. Phosphorus may become less available because of the formation of slowly soluble tricalcium phosphate.

5. Lime Requirements

   a. Lime requirement is the amount of lime required to raise the pH level of an acid soil to a predetermined level.

   b. Areas low in magnesium need dolomitic limestone because it also furnishes magnesium.

   c. The finer the lime, the more quickly it is available to plants. The degree of fineness of limestone affects the rate of calcium release.

6. Time of Lime Application

   a. Lime is usually applied before seeding a legume crop such as soybeans.

   b. Apply the lime to the soil six to ten months before seeding the legume.

   c. Lime applied on sod will gradually penetrate the soil so a fall application may be most helpful, as fall rains will aid lime in penetrating the sod.

7. Method of Application

   a. Lime materials should be mixed well into the soil. This can be done during preparation of the seed bed.

   b. Plow under one-half the application of lime; discing and harrowing in the remainder will usually provide a good distribution.

   c. Manure spreaders can also be used to spread lime if the lime is put on six to eight inches of manure in the bottom of the spreader.

   d. Two other types of lime spreaders are:

      1) a two-wheel, box type of spreader,

2) an endgate spreader.

e. Lime can also be applied from heavy equipment such as trucks.

8. Amount of Lime to Apply -- the amount of lime to apply depends on the following: (Transparency III-2-I)

a. Degree of acidity of the soil (Transparency III-2-H)

b. The buffer capacity of the soil

c. The acidity of the subsoil

d. The crops to be grown (most crops grow better with a pH of 6.0 to 6.8)

e. The grade or purity of the lime materials

f. The frequency of application

Tons of Lime Required to Correct
Usual Types of Soil Acidity
Per Acre

Soil Texture	Slight Acid	Moderate Acid	Strong Acid
Sand & loamy sand	¼-1 Ton	1-2 Tons	1-3 Tons
Loam & silt loam	½-2 Tons	2-3 Tons	3-6 Tons
Silt & clay loam	½-3 Tons	3-6 Tons	6 or above

9. Reaction and plant -- generally, crops favor a slightly acid soil. Alfalfa favors neutral and slightly alkali soils; whereas, blueberrys, watermelon, and azaleas favor strongly acid soils.

Favorable pH for some Louisiana Crops (Transparency III-2-I)

Soybeans	5.5-7.0	Alfalfa	6.5-7.5
Rice	6.0-6.5	Sweet Potatoes	5.0-6.0
Cotton	5.5-6.5	Corn	5.5-7.0
Sugarcane	6.0-6.5	Red, White & Alsike Clovers	6.0-7.0
Hardwood Forest	6.5-7.0		
Pinewood Forest	5.5-6.5	Grasses	5.5-7.0

See Information Sheet for more pH ranges.

10. Greatest availability of soil nutrients depends on soil type and pH. Mineral soils at pH of 6.5 and organic soils at pH of 5.5 have the greatest availability of nutrients from the soils. 54

C. Suggested Student Activities

1. Demonstrate application of lime on a class member's farm.

2. Make a display of different kinds of lime materials.

3. Lab exercise using lime to reduce soil acidity.

4.

D. Suggested Study Questions

1. List some of the benefits obtained from liming a soil.

2. Define lime.

3. List the steps in liming an acid soil for growing certain crops.

4. List common forms of available lime.

5. Define lime requirements.

6. Discuss a method for the application of lime.

7. Describe the appearance of plants growing in soils of different pH levels.

8. Explain the proper procedure for taking a soil test.

SUGGESTED LAB EXERCISE

Procedure

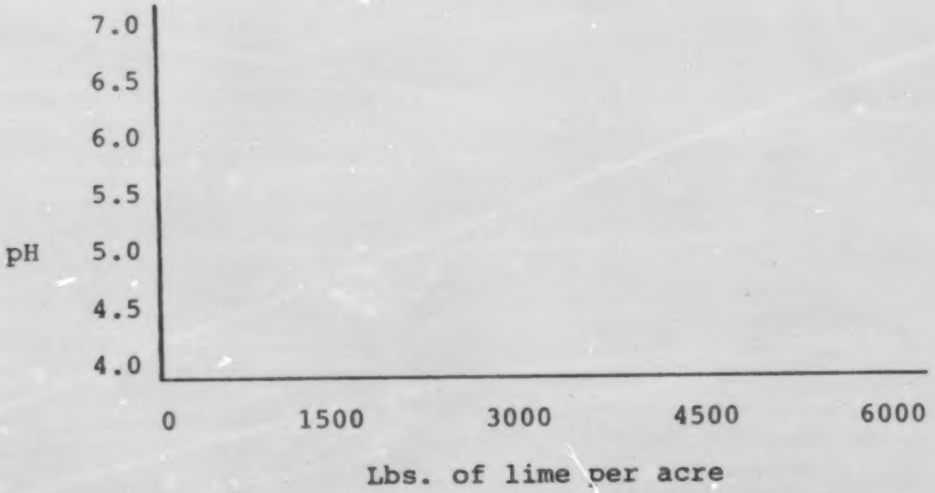
1. Allow the soil to dry and screen through a one-quarter inch hardwood cloth.
2. Measure about two quarts of soil "A" onto the canvas or paper.
3. Add lime as indicated for Treatment 2 below. If the pH of the sample is below 5.0, increase the amount of lime by one-half.
4. Thoroughly mix.
5. Put about one pint of soil in each of two containers.

TREATMENT #	SANDY SOIL (A)		CLAY OR HIGH ORGANIC MATTER SOIL (B)	
	Teaspoon/2 qts.	Lbs./acre	Teaspoon/2 qts.	Lbs./acre
1	None	None	None	None
2	¼	1500	½	3000
3	½	3000	1	6000

6. Repeat this procedure for soil "A" using the amount of lime for Treatment 3.
7. Add soil to two cans labeled Treatment 1 for use as checks.
8. Repeat the entire operation for soil "B", Treatments 1, 2, 3. This will give duplicate containers of each soil for each treatment or a total of 12.
9. Keep the soil moist for about two weeks. Then allow each sample to dry and determine the pH by use of indicators or send portions of the soil to your Soil Testing Service Laboratory.
10. Place the pH values in a table similar to that shown on the next page. Also prepare a graph by plotting the pH obtained for each lime rate.

Treatment Number	Sandy Soil (A) Rate of Lime	pH	Clay or Organic Soil (B) Rate of Lime	pH
1	0	1.. 2.. Av..	0	1.. 2.. Av..
2	1500	1.. 2.. Av..	3000	1.. 2.. Av..
3	3000	1.. 2.. Av..	6000	1.. 2.. Av..

DIAGRAM I



SUGGESTED LAB EXERCISE

Effects of Lime on Crop Growth

Procedure

1. Locate a soil with a pH below 5.0 and collect about six gallons. Even though most plants do not make their best growth on soils with pH values somewhat over 5.0, it is necessary to use an extremely acid soil in order to obtain differences that can be easily recognized.

2. After the soil has been air dried and screened through one-quarter inch hardware cloth, measure two gallons onto a piece of canvas or heavy paper. Add ground limestone (or substitute) according to whether the pH is below or above 5.0 as indicated in the table below. Also add one-half teaspoon of 0-14-14 or similar fertilizer and mix thoroughly. Don't use a fertilizer containing nitrogen.

SOIL TEXTURE	TEASPOONS OF GROUND LIMESTONE PER 2 GALLONS SOIL	
	pH Below 5.0	Between 5.1-6.0
Sand	½	¼
Sandy loam	1	½
Sandy clay loam	1½	3/4
Clay loam	2	1

3. Put this soil into two cans of about one gallon capacity and label.

4. Fill two more gallon cans with soil that has been fertilized but not limed and label them. The cans should have small holes punched in the bottom covered with thin cheese cloth. If the soil is extremely acid it would be advisable to allow the lime to react two or three weeks before the crop is planted.

5. Next, plant about 20 alfalfa or clover seeds or 10 soybean seeds that have been properly inoculated. The alfalfa and clover should be covered about one-half inch deep while the soybean should be covered one inch. This can be done by removing soil from the can before planting, then putting it on top of the seed.

6. Add water slowly to wet the soil thoroughly . You may need to cut some discs of paper to fit

inside the can on top of the soil. This will prevent uncovering the seed while adding water. The paper must be removed as soon as the seeds germinate.

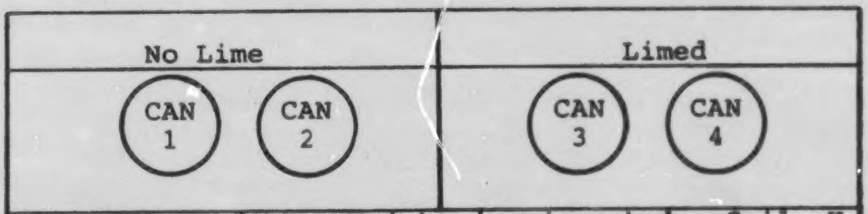
7. After the plants have become well established, thin to a uniform number, probably 10 - 12 per can. This will give you the lime treatments and number of cans shown in Diagram II.

8. Keep the soils moist but not too wet. If this exercise is being done in the spring or fall you may want to put the cans outside. Otherwise keep them in a warm, well-lighted place. Observe closely for a period of four to six weeks.

9. When sufficient growth has been made, clip the plants at soil level. Keep those from each can separate. Allow the plant material to dry, then weigh. Put the results in a table similar to the one shown below.

10. Measure the soil pH after the plants are harvested.

DIAGRAM II



Treatment	Dry Weight (oz./gms.)	Soil pH
No lime #1 #2 Av.		
lime #1 #2 Av.		

59 Suggested Lab Exercise Taking a Soil Sample

Purposes:

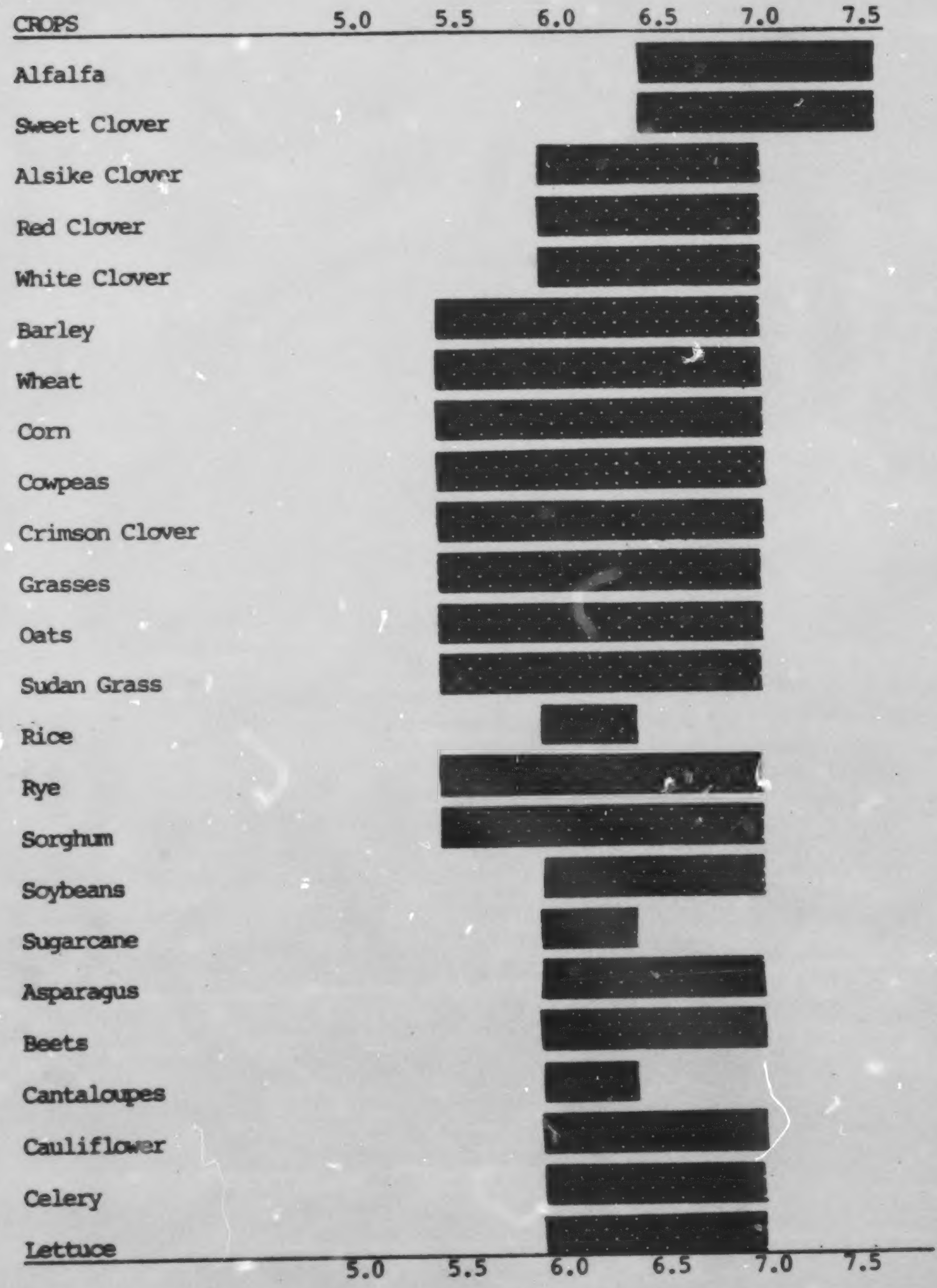
a. Determine recommended fertilization and liming rates for specific crops.
b. Determine from soil analysis report the plant nutrients that need to be applied (esp. N-P-K and lime).
c. Determine from the soil test results levels of calcium, magnesium, iron, manganese, and the percent of organic matter in the soil in addition to the pH level.

Procedure:

a. Contact local county extension agent and obtain soil test information sheets and soil sampling carton. (Transparency III-2-A)
b. Select one -- 8-12 acre field to sample.
c. Select soil auger, probe, or spade. Also, each student will need a clean bucket or container for mixing soil. (Transparency III-2-A)
d. Avoid sampling in unusual areas in a field such as old fence lines, old manure piles, boundaries between slopes and bottom land, or areas near trees. (Transparency III-2-B)
e. Take soil from 10-15 spots in the 8-12 acre field and place the soil in the clean container. Take soil samples from only the top two to four inches of topsoil. (Transparencies III-2-C&D)
f. When using a spade, dig a V-shaped hole to plow depth. Remove a ½-inch slice of soil from the face of the hole. Take only the middle inch of soil from the soil slice and place in a clean container. (Transparency III-2-D)
g. After taking soil from 10-15 spots, mix soil thoroughly in the container. (Transparency III-2-E)
h. After sampling, fill out the information sheet relative to the field you have sampled. Correct information is essential for accurate test results. (refer to Soil Test Information Sheet).
i. Be sure to identify samples by assigning a number to each field sampled and write that number on the soil sample carton. Keep records as to which fields were sampled and the dates they were sampled. Take completed forms and cartons to county extension agent. He will send the sample to soil testing laboratory. (Transparency III-2-G)
j. When recommendations are returned, file them for future reference. It is important to follow the recommendations for suggested fertilizer and liming rates in order to increase the productivity of the fields sampled.

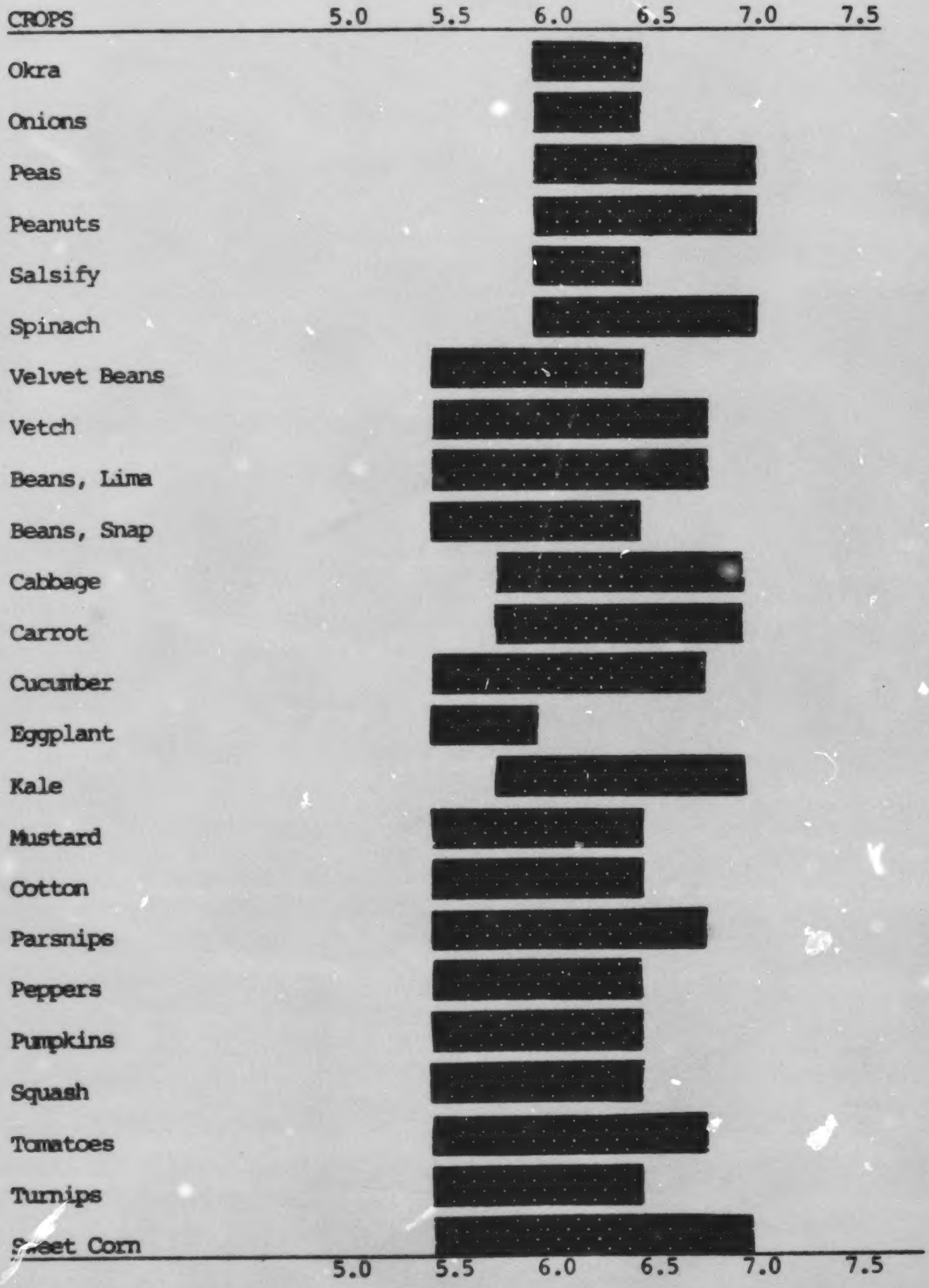
INFORMATION SHEET

Suitable pH Range for Various Crops



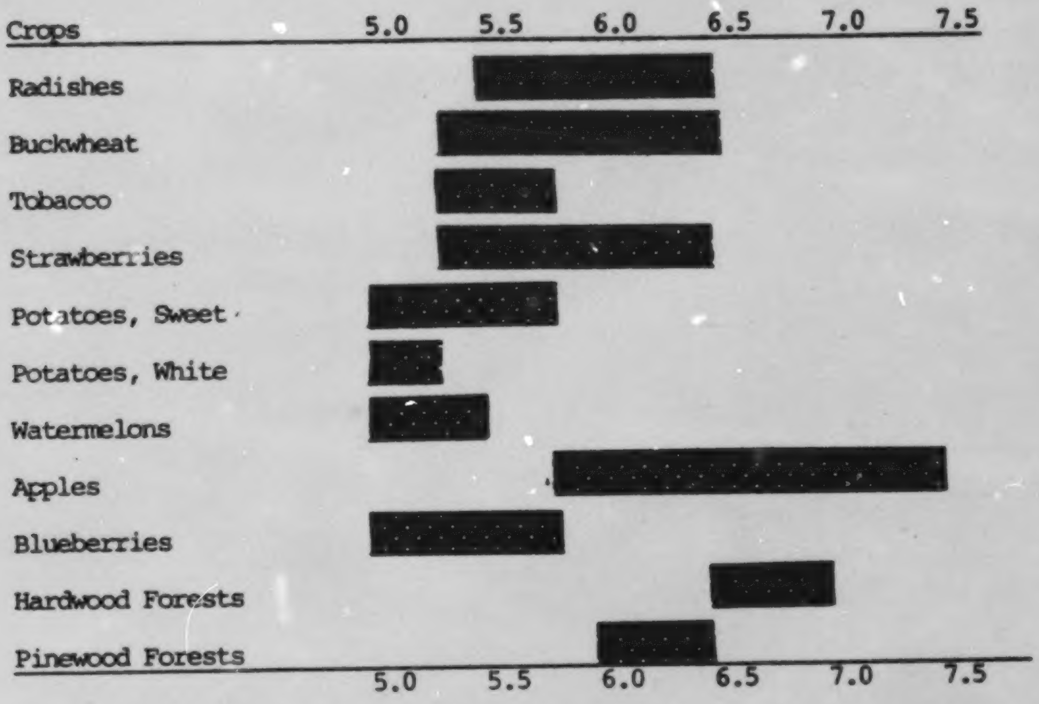
INFORMATION SHEET (Continued)

Suitable pH Range for Various Crops

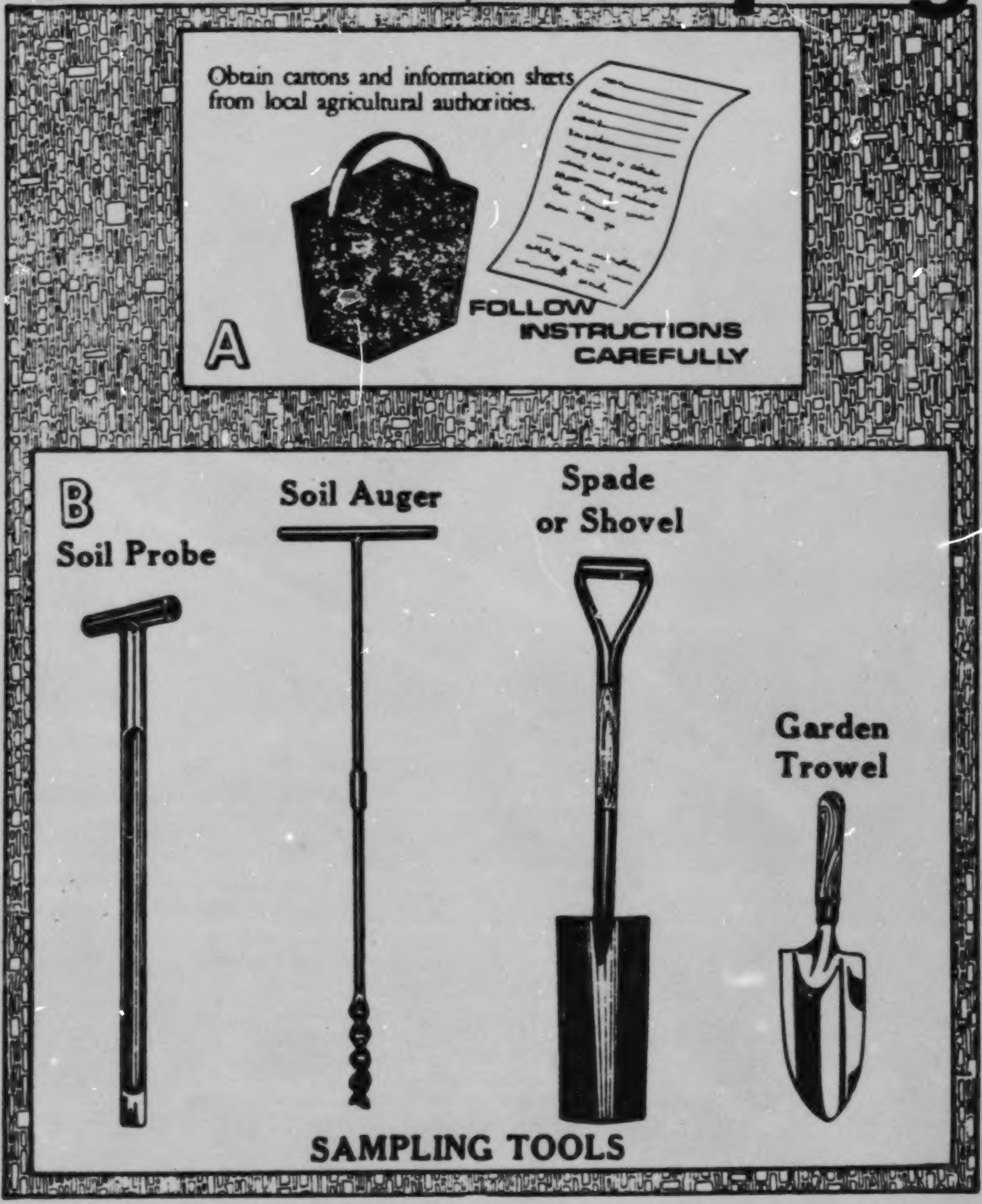


INFORMATION SHEET (Continued)

Suitable pH Range for Various Crops



SOIL → Sampling


Obtain cartons and information sheets from local agricultural authorities.

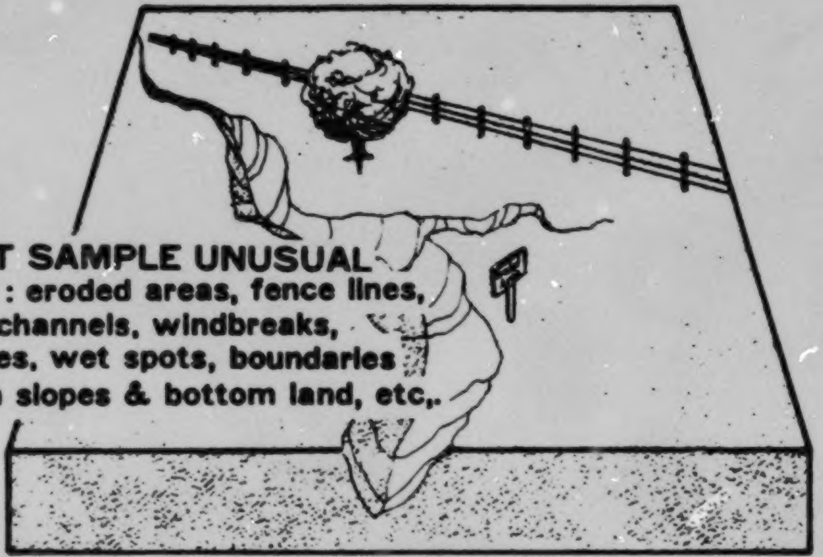
FOLLOW INSTRUCTIONS CAREFULLY

A
B
Soil Probe
Soil Auger
Spade or Shovel
Garden Trowel

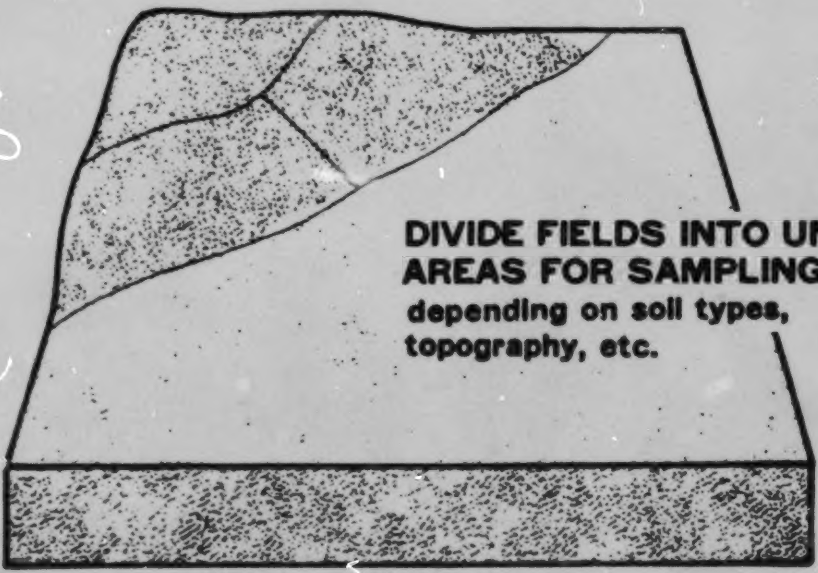
SAMPLING TOOLS

TRANSPARENCY III-2-A

SOIL SAMPLING



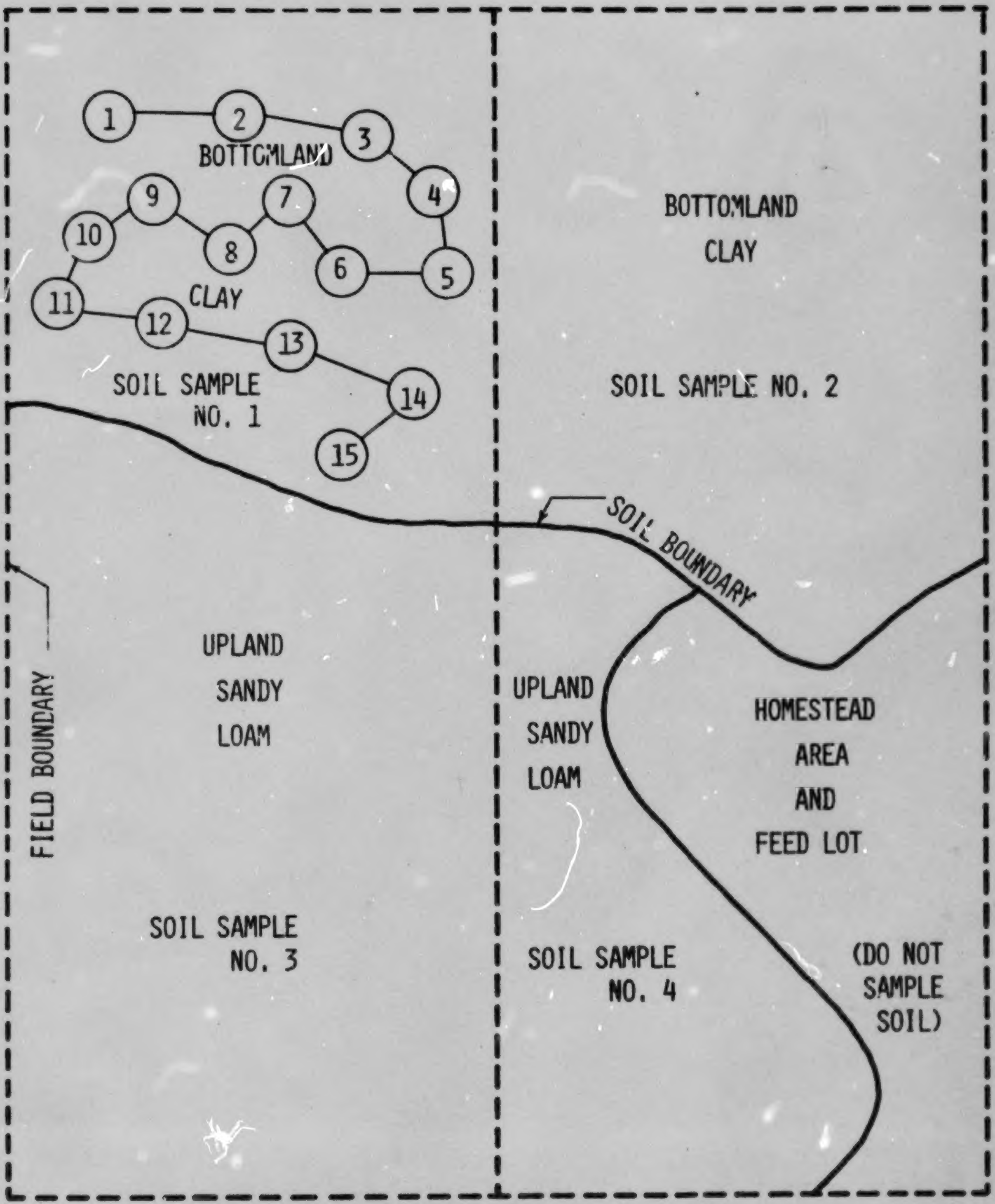
DO NOT SAMPLE UNUSUAL AREAS : eroded areas, fence lines, terrace channels, windbreaks, near trees, wet spots, boundaries between slopes & bottom land, etc,.



DIVIDE FIELDS INTO UNIFORM AREAS FOR SAMPLING depending on soil types, topography, etc.

TRANSPARENCY III-2-B

COLLECTION OF SOIL SAMPLES

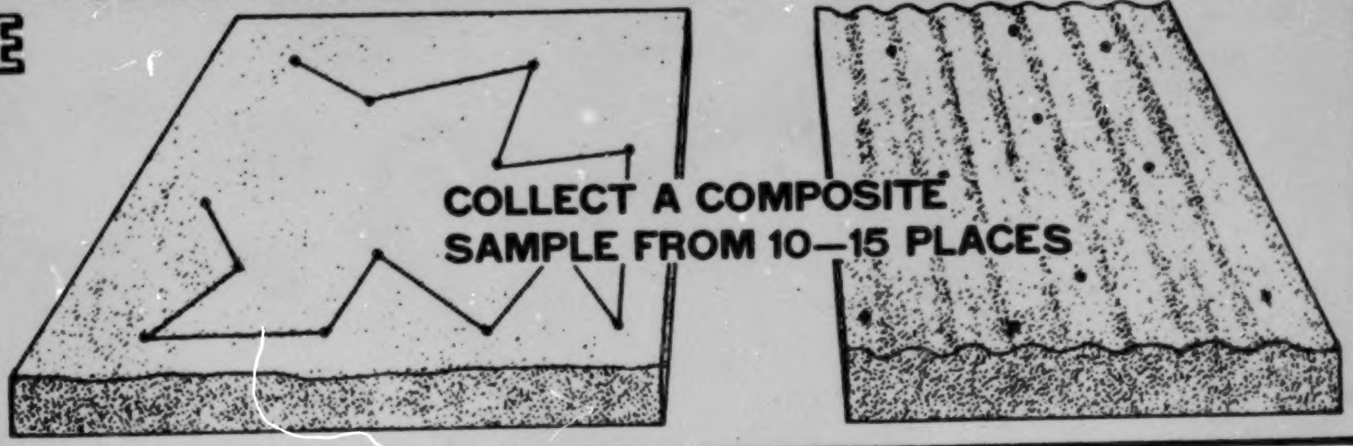

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
BOTTOMLAND
CLAY
SOIL SAMPLE NO. 1
BOTTOMLAND CLAY
SOIL SAMPLE NO. 2
SOIL BOUNDARY
FIELD BOUNDARY
UPLAND SANDY LOAM
SOIL SAMPLE NO. 3
UPLAND SANDY LOAM
SOIL SAMPLE NO. 4
HOMESTEAD AREA AND FEED LOT
(DO NOT SAMPLE SOIL)

Transparency III-2-C

SOIL SAMPLING

E

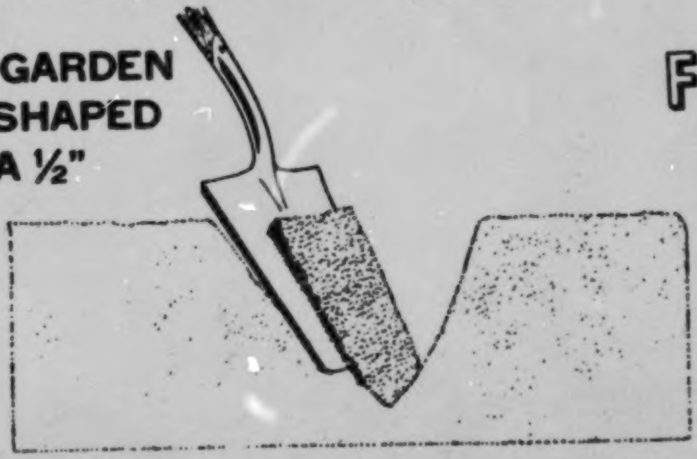
PASTURE AREA **FIELD CROP AREA**



COLLECT A COMPOSITE SAMPLE FROM 10—15 PLACES

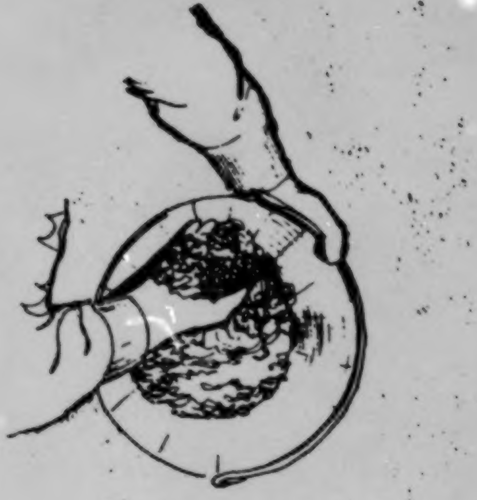
F

WITH A SPADE OR GARDEN TROWEL DIG A V—SHAPED HOLE, THEN TAKE A ½" SLICE FROM THE SMOOTH SIDE OF THE HOLE



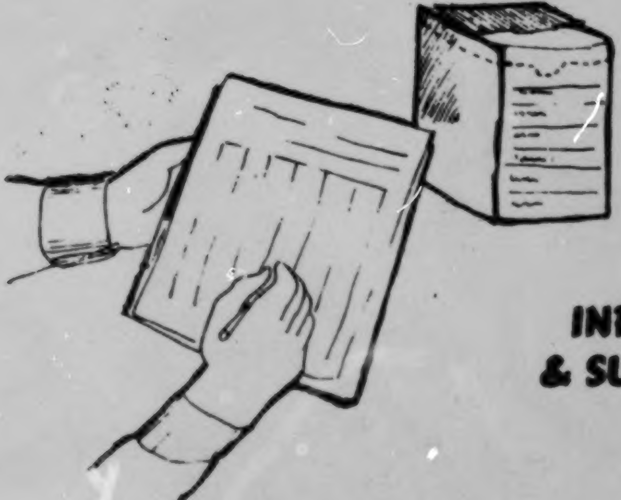
TRANSPARENCY III-2-D

SOIL SAMPLING



G

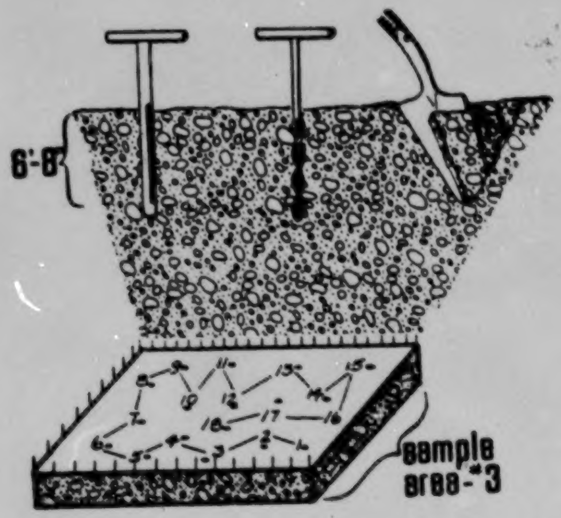
MIX SAMPLES IN A CLEAN CONTAINER



H

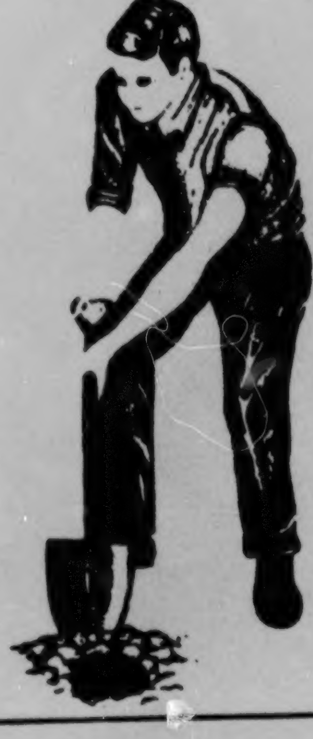
COMPLETE INFORMATION SHEET & SUBMIT WITH SAMPLE

TRANSPARENCY III-2-E

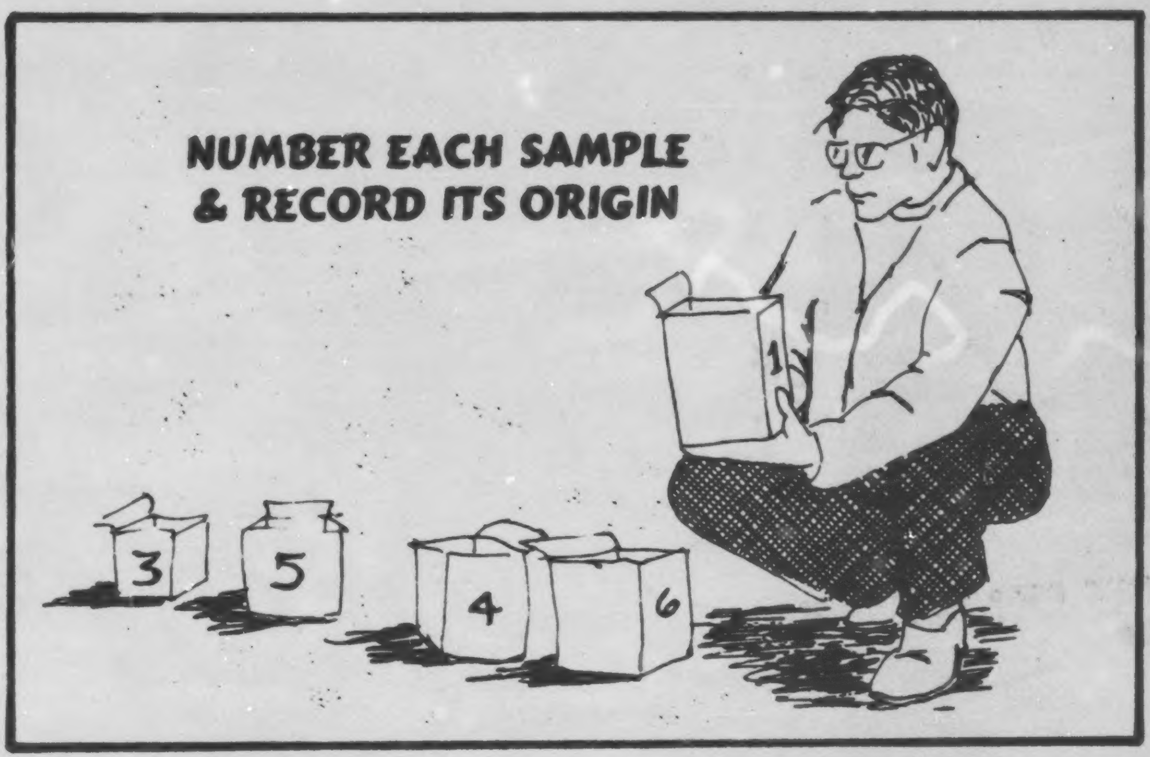

6"-8"
sample area-#3

TAKE SOIL TO PLOW DEPTH FROM AT LEAST 15 SPOTS FOR EACH SAMPLE AREA

IF SPADE IS USED, SAVE SOIL FROM MIDDLE OF SLICE



SOIL SAMPLING



NUMBER EACH SAMPLE
& RECORD ITS ORIGIN

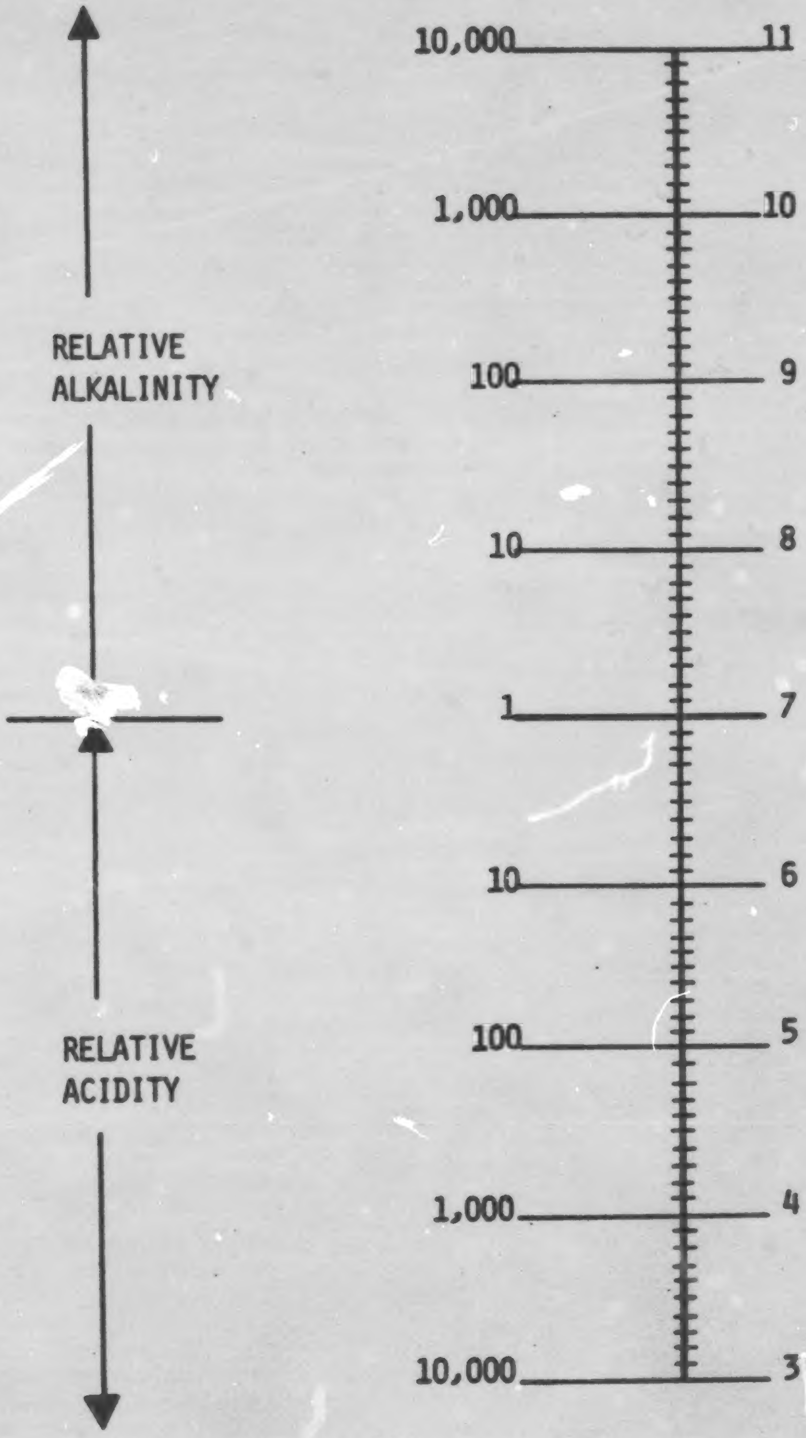
FOLLOW SOIL TEST RECOMMENDATIONS

V. A. I

III-B-4
No. 5

TRANSPARENCY III-2-G

pH SCALE


RELATIVE
ALKALINITY
RELATIVE
ACIDITY
10,000
11
1,000
10
100
9
10
8
1
7
10
6
100
5
1,000
4
10,000
3

RELATIVE ACIDITY AND ALKALINITY
TRANSPARENCY III-2-H

SUITABLE pH FOR SOME LOUISIANA CROPS

ACIDITY RANGE ALKALINITY RANGE

4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5

CROP	Very Strong	Strong	Med	Slight	Neutral		Slight	Mod
SOYBEANS			▨	▨	▨			
RICE				▨				
COTTON			▨	▨				
SUGARCANE				▨				
HARDWOOD FORESTS					▨			
PINEWOOD FORESTS			▨	▨				
ALFALFA					▨	▨		
SWEET POTATOES		▨	▨					
CORN			▨	▨	▨			
CLOVERS				▨	▨			
GRASSES			▨	▨	▨			

TRANSPARENCY III-2-I

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT IV: Soil Classification and Land Use Evaluation

LESSON 1: Soil Classification and Land Use Evaluation

I. Preparation for Instruction

A. Objective

1. Terminal: Explain how soils are classified, how to use soil survey and land use maps, and how to evaluate farm land for crop production.

2. Specific:

   a. List the physical features of land and soil necessary for classifying land.

   b. Explain the characteristics of each of the land classes.

   c. List the different land classes.

   d. Explain how land capability classes are recorded for use.

   e. Select the equipment that is needed to classify soils.

   f. State the management practices that should be followed to obtain maximum yields and proper soil conservation.

   g. Distinguish between the different soil structures and textures.

   h. Determine the best possible use of land according to the soil depth, texture, permeability, slope, surface drainage, and degree of erosion.

   i. Determine the specific treatment of land.

j. Determine the criteria which can be used in the classification of land for agriculture.

k. Name two kinds of water erosion.

l. Explain why soil erosion is so important to farmers.

m. Name the factors that influence erosion and discuss each as it relates to soil erosion.

n. Evaluate what crops grow best on the different soil types.

B. Review Teaching Material

1. Donahue, Roy L., Roy H. Follett, and Rodney W. Tulloch. Our Soils and Their Management. Danville: Interstate Publishers, 1976.

2. Foth, H.D. and L.M. Turk. Fundamentals of Soil Science. 5th Edition, New York: John Wiley and Sons, Inc., 1972.

3. Knuti, Leo L. and Milton Korpe. Profitable Soil Management. 2nd Edition, Englewood Cliffs, New Jersey: Prentice Hall Inc., 1970.

4. "Land Judging in Oklahoma," Circular E-598, Oklahoma Agriculture Extension Service, Stillwater, Oklahoma.

5. "Land Capability Classification," Agriculture Handbook No. 210, Soil Conservation Service, U.S. Department of Agriculture.

6. "General Soil Areas and Associated Soil Service Groups of Louisiana," Department of Agronomy, Louisiana State University and Agricultural and Mechanical College, Agricultural Experiment Station, May, 1962.

7. "Soil Judging for Louisiana Future Farmers of America," State Department of Education, Louisiana, Bulletin 1505, 1978.

C. Special Arrangements

1. Materials

a. Land use map of Louisiana (check Soil Conservation Unit)

b. Equipment for collecting soil sample

2. Travel

a. Field tour to farm to study land classes

b. Field tour to farm and examine soil conservation map to observe the shading and coding system designating land capability class of farm.

3. Audio-visual equipment

Slides of various land classes and their suitability for agriculture. (check Soil Conservation Unit)

II. Presentation of Lesson and Suggested Student Activities

A. Motivation

1. Students will be given map of Louisiana with soil classes and their capability, and students will be given a map of Louisiana that shows the different soil and capability classes and they will identify the various classes.

2. Students will collect a soil sample and determine the texture by feel and appearance.

3. Students will be shown slides on various soil classes and their suitability for cultivation.

B. Content Outline

1. Terms

   a. Soil Classification -- a systematic grouping of soils based upon properties that can be recognized by sight or feel.

   b. Soil Series -- a group of soils similar in most respects but varying in texture of the top soil.

   c. Soil Type -- a subdivision of the soil series based on texture of the top soil.

   d. Soil Phases -- represents variations within the soil type based on features such as the slope, drainage, or degree of erosion.

   f. Soil Association -- includes soil series with two or more similar profile characteristics and located in the same general area.

   g. Soil Family -- includes soil series whose properties would have similar effects on plant growth.

   h. Soil Maps -- scale drawings, sketches, or photographs of areas showing different soil series, types, phases, or land-use classes.

   i. Land -- refers to soil area denoting location or use.

   j. Land Capability -- denotes cropping practices for which land is best suited or is capable of supporting.

2. Soil Classification (Transparency IV-1-B)

   There are many types or classes of land and each one is determined by various soil factor(s). In a land classification system, soils are grouped according to their capabilities, based on these six soil class factors: surface texture, permeability, depth of soil, slope, erosion (wind and water), and surface runoff.

a. **Surface Texture** (Transparencies IV-1-A-C)

Texture of the surface soil or "A" horizon determined by feel indicates the proportion of sand, silt, and clay that make up the soil mass. This is normally considered to be at least plow depth or 6 inches; however, erosion may have removed the surface to such an extent that as little as 1 to 2 inches remain.

Definition of Terms Used

1) "Sand" is the gritty material which is felt when soil is rubbed by the finger. Individual grains can be readily seen or felt.

2) "Silt" is the floury material which is felt when soil is rubbed by the finger. It is neither gritty nor sticky.

3) "Clay" usually forms very hard lumps or clods when dry, and is plastic and usually sticky when wet. Moist soil, when pinched out between the thumb and finger will form a long flexible "ribbon."

4) "Loam" is a combination or mixture of sand, silt, and clay.

NOTE: Soil texture by sense of touch is easier to determine when soil is moist.

Three major groups are recognized. Surface texture of a soil is an expression of the relative amounts of sand, silts, and clays in the soil body. (Fig. 1) Fourteen soil textures are recognized in the soil survey manual Agricultural Handbook No.18, 1951, p. 213, but grouped into three broad textural groups for land judging purposes. Schools may wish to make finer breakdowns for teaching purposes. (Transparency IV-1-E)

Figure 1

1. Sandy Soils	Coarse-Textured Very Sandy Soils	Sands Loamy Sands
2. Loamy Soils	Moderately Coarse-Textured Soils	Sandy Loam Fine Sandy Loam
	Medium-Textured Soils	Very Fine Sandy Loam Loam Silt Loam Silt
	Moderately Fine Textured Soils	Clay Loam Sandy Clay Loam Silty Clay Loam
3. Clayey Soils	Fine-Textured Soils	Sandy Clay Silty Clay Clay

b. Permeability (movement of air and water in the subsoil)

Soils may be placed into permeability classes through studies of structure, texture, cracking, density, and clay films.

1. Rapid -- These soils have loose or open sandy subsoil with little if any defined structure other than single grained (very little restriction to movement of water and air).

2. Moderate -- These soils have friable to slightly firm, usually loamy, subsoils with blocky, sub-angular blocky, and prismatic structure.

3. These soils have firm, loamy, and clayey subsoils with medium blocky, sub-angular blocky, and prismatic structures. Slow permeable soils frequently have deep surface and thick transition zones from the surface to the most clayey zone in the subsoil.

4. Very Slow -- These soils have very firm, dense, clayey or claypan subsoils with massive or sharp angular blocky structure. Root growth and movement is generally restricted to going between the blocks or "peds."

c. Depth of Soil

The depth of soil is determined by the total thickness of soil layers that are significant to soil use and management, generally underlaid by rock or clay and shale beds or unaltered alluvial materials. This is the depth to which plant roots are normally expected to develop. Alluvial soils are usually considered deep because of an effective root feeding zone even though the soil is young and a true subsoil has not developed.

1. Deep Soil -- Soils more than 36 inches deep.

2. Moderately Deep Soils -- Soils 20 to 36 inches deep.

3. Shallow Soils -- Soils 10 to 20 inches deep.

4. Very Shallow Soils -- Soils less than 10 inches thick.

d. Slope

This is the number in feet of fall in each 100 foot distance. The following are definitions of slope terms:

1. Nearly Level -- Less than 1 foot fall in each 100 feet.

2. Gently Sloping -- 1-to-3 foot fall in each 100 feet.

3. Moderately Sloping -- 3-to-5 foot fall in each 100 feet.

4. Strongly Sloping -- 5-to-8 foot fall in each 100 feet.

5. Steep -- 8-to-12 foot fall in each 100 feet.

6. Very Steep -- Above 12 foot fall in each 100 feet.

e. Erosion -- Wind and Water

Erosion is the loss of soil by water and wind. The following are definitions of erosion terms:

1. None to Slight -- Less than 25% of surface soil removed and no gullies.

2. Moderate -- 25% to 75% of surface soil removed with or without gullies, crossable with farm machinery. Moderate erosion may or may not change a capability class but it always is a factor to keep an area out of Class I.

3. Severe -- 75% or more of the surface soil removed with or without occasional uncrossable gullies (gullies more than 100 feet apart) and/or severe blowouts and accumulations by wind.

4. Very Severe -- 75% or more of surface soil removed with frequent uncrossable gullies (gullies less than 100 feet apart) and/or very severe blowouts and accumulations by wind.

f. Surface Runoff

Surface runoff is the result of a combination of natural factors including land slope and water infiltration rate of the soils. Refers to the relative rate water is removed by flow over the surface of the soil.

1. Rapid -- Surface water flows rapidly. A considerable amount of rainfall is lost from the surface which increases the hazards of erosion and droughty conditions. Fields with slopes of 3% and above

(except rapidly permeable soils) would go in this category.

2. Moderate -- This is considered as "normal" runoff from soils with slopes of one to three percent (1-3%), rapidly permeable soils excepted.

3. Slow -- Surface water flows away slowly. Surplus water on clayey soils is an occasional problem. Includes nearly level areas with moderately permeable subsoils, and nearly level slowly permeable sandy soils.

4. Very Slow -- Surface water flows away very slowly. Slopes may be nearly level to concave, have deep sandy soils with rapidly permeable subsoil or be nearly level sandy soils with moderate permeability. Some soils may remain wet for long periods.

g. Major factors that keep fields from being Class I land (See Soil Judging, Bul. 1505)

This section is generally self-explanatory. On Class I land check Factor 9. Any one or more factors that would keep the area out of Class I will be checked. The contestant's decision will determine the ones to check. Note that "overhead water" alone is not a factor to take land out of Class I, even though it would require a diversion terrace.

1. Surface Texture -- Surface soil texture is not a major factor except for sandy soils. Sandy soils can be no better than Class III because of erosion hazards of both wind and water that are very difficult to control.

2. Permeability -- Only two conditions, rapid or very slow, will be major factors.

3. Depth of Soil -- Only shallow or very shallow soils will be major factors.

4. Slope of Land -- Any slope over nearly level will be considered a major factor.

5. Erosion -- All conditions except none to slight will be considered major factors.

6. Surface Runoff -- Only very slow (rapidly permeable sandy soils excepted) and rapid runoff conditions will be considered as major factors.

When "wetness" or "frequently flooded" factors are shown under "other factors" it would be necessary to check practice No. 7 or No. 8 respectively.

h. Land Capability Classes Defined

SUITED FOR CULTIVATION AND OTHER USES SUCH AS GRAZING, FORESTRY, OR WILDLIFE FOOD AND COVER.

Class I	Soils in Class I have few limitations that restrict their use. Overhead water does not change the land class--treatment is usually on adjacent soils.
Class II	Soils in Class II have some limitations that reduce the choice of plants or require moderate conservation practices.
Class III	Soils in Class III have severe limitations that reduce the choice of plants or require special conservation practices or both.
Class IV	Soils in Class IV have very severe limitations that restrict the choice of plants, require very careful management, need special conservation or all three.

LAND LIMITED IN USE GENERALLY IS NOT SUITED FOR CULTIVATION; SUITED FOR GRAZING, FORESTRY, OR WILDLIFE FOOD AND COVER	Class V	Soils in Class V have little or no erosion hazards, but have other limitations that are impractical to remove that limit their use largely to pasture, range, woodland, or wildlife food and cover. These may include very poor drainage with wet, poorly drained profiles or frequent flood areas. (Frequent flooding will be shown with "other factors" when it occurs.)
	Class VI	Soils in Class VI have severe limitations that make them generally unsuited for cultivation and limit their use largely to pasture or range, woodland, or wildlife food and cover.
	Class VII	Soils in Class VII have many severe limitations that make them unsuited for cultivation and that restrict their use largely to grazing, woodland, or wildlife.
LAND NOT SUITED FOR CULTIVATION, GRAZING, OR FORESTRY.	Class VIII	Soils and land forms in Class VIII have limitations that preclude their use for commercial plant production and restrict their use to wildlife, recreation, water supply, or aesthetic purposes.

3. Land Use and Recommended Soil Treatments.

After land is divided into land capability classes, one should be able to determine which farming practices are needed to conserve soil water, and maintain and improve productivity.

Soil treatment and land use are divided into these three parts: vegetative improvement, mechanical practices, fertilization and soil amendments.

a. Vegetative

For cropland use -- Class I through IV -- use soil conserving and/or soil improving crops.*

1. Every 4th or 5th year -- applicable to Class I land

2. Every 3rd or 4th year -- applicable to Class II land

3. Every 2nd year -- applicable to Class III land

4. Every year -- applicable to Class IV land

5. Do not burn crop residue -- self-explanatory.

6. Residue management -- provides for a protective cover by leaving crop residue of any previous crop as a mulch on or mixed in the surface plow layer of the soil.

For Pasture, Range, Wildlife, or Commercial Woodland

7. Establish recommended grasses or grasses with legumes. This practice is to be used on lands not producing suitable permanent vegetation or on idle or cultivated lands not suitable for cultivated crops. Because of differences in interpretation as to what is considered suitable for practical purposes, this practice will be used on all Class V, VI, and VII soils except where tree plantings are made.

8. Use proper pasture or range management. The application of practices to keep plant growth active over as long a period as possible; to encourage the growth of desirable

grasses and legumes while crowding out weeds, brush, and inferior grasses.

9. Protect from burning. Do not burn grass, legumes, or timber.

10. Control grazing. Carry out a system of grazing that will maintain or improve desirable vegetation on pasture or range; deferred grazing, rotation grazing, and proper stocking are some of the practices.

11. Plant recommended trees. For postlots, farmstead windbreaks, field windbreaks, and commercial woodland plantings.

*Soil Conserving Crops -- are considered to be those crops that prevent or retard erosion and tend to maintain rather than deplete soil organic matter. Close-seeded crops are generally regarded as soil conserving crops.

Soil Improving Crops -- improve or replenish rather than deplete soil organic matter, improve soil structure and tilth. Increase water intake and, in general, increase the productivity of the soil. Grasses and legumes would be such crops.

12. Harvest trees selectively. A system of cutting in which single trees, usually the largest, or small groups of such trees are removed and reproduction secured under the remaining stand.

13. Use only for wildlife or recreation area. This means protection or the development of areas that cannot be used for grazing, forestry, cultivation, or urban uses.

b. Mechanical

14. Control brush or trees. This may be accomplished by spraying with chemicals and/or use of machinery. The purpose is to improve the desirable vegetative cover by

removing or killing undesirable brush and trees, or remove timber so land can be farmed in case of Class I to IV. This practice should not be used when brushy material can be controlled by normal farm plowing.

15. Terrace and farm on contour. Terrace is an embankment or ridge of earth constructed across the slope to control runoff and minimize erosion. Conduct farming operations on the contour or at right angles to slope direction.

16. Maintain terraces. Use practices that keep terraces working effectively.

17. Construct diversion terrace. A diversion terrace is a channel with a supporting ridge on the lower side, usually has greater horizontal and vertical spacing, and is constructed to handle a larger flow of water than normal field terraces.

18. Install drainage system. Remove excess surface or ground water from land by means of surface or subsurface drains. Used when wetness is a factor.

19. Control gullies. Use one or more conservation practices that will adequately control runoff and erosion.

20. No mechanical treatment needed -- use when one or more mechanical practices, No.'s 14 to 19, would not be recommended. Specifically, it will be checked:

    1. When brush and trees and/or outside water are not problems on Class I land.

    2. On Class II land where erosion or drainage are not problems.

3. On sandy soils where gully erosion control is not recommended. 77

c. Fertilizer and Soil Amendments

The given information at a site pertaining to deficiencies of lime, phosphate, or potash (excluding nitrogen) appear on the information card as actual values of soil pH and pounds per acre of phosphate and potash. The decision of the contestant as to whether to add lime or fertilizers will be based on the soil test data and the contestant's knowledge of fertilizer recommendations, rather than an automatic check off of the given deficient nutrients.

No set of limits with regard to lime or fertility requirements will begin to fit all areas of the country and all crops. Each has its own requirements. However, the intent of this section is not to make soil fertility experts out of your youth but merely to have soil judges become familiar with present-day terminology and to have some knowledge about soil fertility requirements.

pH

Soils with pH's of 4 and 5 are usually the soils requiring lime. However, lime is recommended on soils with pH's up to 6.3. Above this pH, no lime is recommended. Therefore, when any pH value given for a field is less than 6.3, you would check practice No. 21.

Phosphorus

Low levels of phosphate in soils are 25 lbs. per acre or less. However, soils with phosphate levels up to 60 lbs. per acre do require the addition of phosphate for maximum production. When any value is given less than 60 lbs. per acre, check No. 22 on the score card.

Potassium

Soils with potash levels of 125 lbs. per acre or less are considered deficient and require the addition of potash. Potash is recommended to some extent on soils with as much as 300 lbs. per acre for certain crops, but above that level no potash is added. When any value is given less than 300 lbs. per acre, check No. 23 on the score card.

Nitrogen

No established level of nitrogen in the soil adequately indicates sufficiency or deficiency for all crops. Any value that would be deficient for corn, cotton, or small grains may be adequate for clovers or alfalfa. On the other hand, adequate level of nitrogen for small grains or corn may be a deficient amount for maximum production of bermuda grass. The adequate level of nitrogen in the soil is dependent mostly on the yield goals rather than a deficient level.

Because of this fact, nitrogen deficiency will still be a given factor without a numerical figure. If a nitrogen deficiency is indicated, then No. 24 on the score card is checked.

These low and high values are composite values taken from several state Soil Testing Laboratories' fertility recommendations for most soils.

Example: Assume the given soil test information shows:

pH - 5.5
Phosphorus - 30 lbs./acre
Potassium - 325 lbs./acre
Nitrogen - Deficient

On the score card No.'s 21, 22, and 24 will be checked.

d. General Instructions and Interpretations

Many contestants from distant areas will tend to interpret what they see in light of their own conditions. For that reason it is necessary to explain in detail those items that may have local variations.

Present Practices or Cover on the Land

Disregard practices and/or cover on the land at the time of the contest except for brush and trees which could possibly occur on Class I to VI inclusive. Should this condition occur, it would be necessary to remove brush, trees, and timber to reach the most intensive use. In other words, use practice 14.

Other examples -- if terraces are needed and terraces are already on the area, you would use practice 15, terrace and farm on the contour. Should a cover of grass be on an area of Class V, VI, or VII land you would still use practice 7, to establish recommended grass or grass with legumes. What is a good stand of grass to a Western contestant could be considered a poor stand of grass to a contestant from the Eastern U.S.A.

"Other Factors" -- when factors not observable by contestant (which require extended study, or information is not available from a single observation) affect the treatment of capability they will be shown for each field under "other factors." Contestants will then prescribe the correct treatment. Factors that will be given when they influence treatment are:

1. Wetness -- Would be a factor to keep out of Class I. Would also require practice 18 under treatment. (Moderately wet for Class II or wet for Class V will be shown)

2. Frequently Flooded -- Flooding would place the area in Class V soil. Practice 20 would apply under treatments.

3. Overhead Water -- This condition does not take the area out of Class I but would require diversion terrace practice 17. Practice 16 is not checked when using division

terraces. These are much larger than conventional terraces, are usually not farmed, and could be constructed on adjoining property where maintenance was not possible.

4. Needs Wind Break -- Where this is indicated, practice 9 and 11 would be needed.

5. Desires Post Lot or Wood Lot -- This factor shown would call for practices 9, 11, and 12.

6. Timber Production -- Operator desires to go into timber production in adapted areas. Would also require practices 9, 11, and 12.

e. Guides to Capabilities and Treatment Practices

In order to ensure uniformity in teaching, Tables I to V inclusive have been prepared. These Tables are designed to show various combinations of soil, texture, permeability, depth, slope, erosion, runoff, wetness, and flooding that could occur and the resulting capability class. Applicable treatments are also shown. Please study the special notes at the beginning of each table and at the end of the tables.

Abbreviations Used in Tables I to V Inclusive

The following abbreviations will apply to the table.

V.S. = very slowly permeable or very slow surface runoff
S. = slow permeability or slow surface runoff
M. = moderately permeable, moderate erosion, or moderate surface runoff
R. = rapid permeability or rapid runoff
N. = none to slight erosion
Sev. = severe erosion

V. Sev. = very severe erosion
N.L. = nearly level
G.S. = gently sloping
M.S. = moderately sloping
Str. = strongly sloping
Steep = steep slopes
V. Steep = very steep slopes

4. Land Use and Evaluation for Agriculture (Transparency IV-1-D)

   In order for students to develop an ability in land use evaluation, they have to know the various soil class factors that determine the land capability. The various soil class factors are:

   a. Textures of surface soil and subsoil

   b. Depth of surface and subsoil

   c. Color of surface soil

   d. Soil structure

   e. Stoniness

   f. Ease of cultivation

   g. Surface drainage

   h. Percent of slope

   i. Degree of erosion

   j. Land capability classes

C. Suggested Student Activities

1. Examine the maps provided by the instructor and determine the predominant soil series in your parish. (Soil maps IV-1-F,G,&H)

2. Locate a farm on the map and determine the soil series found.

3. Prepare a chart with descriptions of each land capability class and the degree of conservation treatment needed.

4. Visit a farm near the school which has been mapped on the basis of land use. Study the land classes and describe in the content outline and on the land use map.

5. Examine soil conservation land use map on a farm and observe the shading and coding system for designating land capability classes.

6. Judge a land site(s) and classify soil according to soil class factors.

D. Suggested Study Questions

1. List the physical factors of soil necessary for classifying land.

2. Name the land classes.

3. What are the primary uses of each land class?

4. Explain how each of the soil factors are evaluated.

   a. Surface texture

   b. Permeability

   c. Depth of soil

   d. Slope

   e. Degree of erosion

   f. Surface runoff

5. Explain the difference between soil structure and soil texture.

6. Explain the different recommended soil treatments for each land capability class for the following practices:

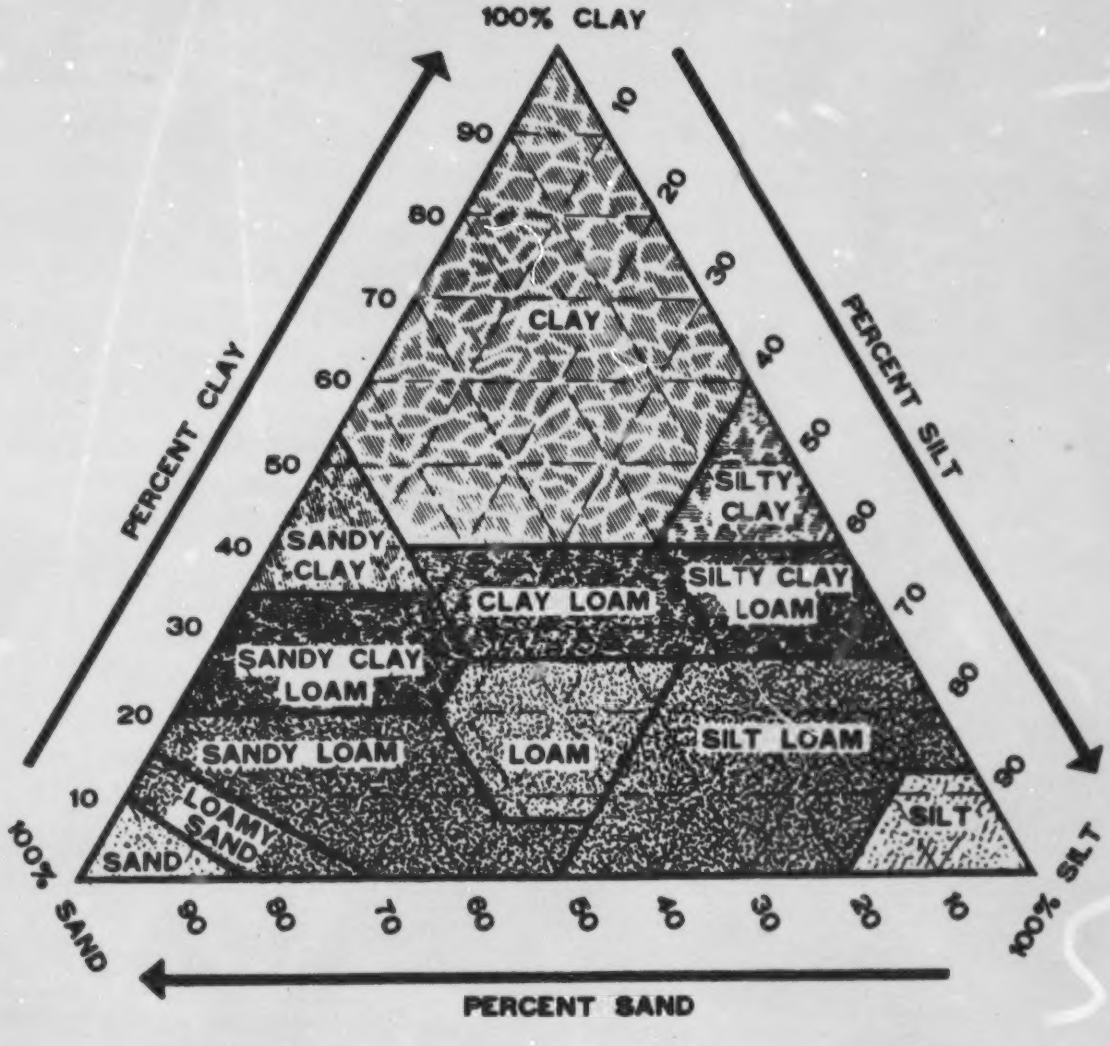
   a. Vegetative

   b. Mechanical

   c. Soil and fertilizer amendments

7. Explain why soil erosion is so important to farmers.

Soil Triangle


100% CLAY
PERCENT CLAY
PERCENT SILT
PERCENT SAND
100% SAND
100% SILT
90
80
70
60
50
40
30
20
10
CLAY
SANDY CLAY
SILTY CLAY
CLAY LOAM
SILTY CLAY LOAM
SANDY CLAY LOAM
SANDY LOAM
LOAM
SILT LOAM
LOAMY SAND
SAND
SILT

Transparency IV-1-A

FFA SOIL JUDGING SCORE CARD NL-1

Contestant No.____________ ____ Field No.______________
Name ____________ ____________________
Address ____________ ____________________
Parish/School ________________________________

Part 1—Soil Class Factors

Indicate by an X in the square with number

Score

A. SURFACE TEXTURE
☐ 1. Sandy soils
☐ 2. Loamy soils
☐ 3. Clayey soils

B. PERMEABILITY
☐ 1. Rapid
☐ 2. Moderate
☐ 3. Slow
☐ 4. Very slow

C. DEPTH OF SOIL
☐ 1. Deep
☐ 2. Moderately deep
☐ 3. Shallow
☐ 4. Very shallow

D. SLOPE
☐ 1. Nearly level
☐ 2. Gently sloping
☐ 3. Moderately sloping
☐ 4. Strongly sloping
☐ 5. Steep
☐ 6. Very steep

E. EROSION—WIND & WATER
☐ 1. None to slight
☐ 2. Moderate
☐ 3. Severe
☐ 4. Very severe

F. SURFACE RUNOFF
☐ 1. Rapid
☐ 2. Moderate
☐ 3. Slow
☐ 4. Very slow

G. MAJOR FACTORS that keep area out of Class I
☐ 1. Texture ☐ 5. Erosion
☐ 2. Perm. ☐ 6. Runoff
☐ 3. Depth ☐ 7. Wetness
☐ 4. Slope ☐ 8. Flooding
☐ 9. None

H. LAND CAPABILITY CLASS
☐ 1. Class I ☐ 5. Class V
☐ 2. Class II ☐ 6. Class VI
☐ 3. Class III ☐ 7. Class VII
☐ 4. Class IV ☐ 8. Class VIII

Part 2
Recommended Soil Treatments

Needed for different land capability classes

Score

VEGETATIVE
Use soil conserving and/or soil improving crops:
☐ 1. Every 4th or 5th year
☐ 2. Every 3rd or 4th year
☐ 3. Every 2nd year
☐ 4. Every year
☐ 5. Do not burn crop residue
☐ 6. Residue management and/or minimum tillage
☐ 7. Establish recommended grass or grasses and legumes
☐ 8. Proper pasture and range management
☐ 9. Protect from burning
☐ 10. Control grazing
☐ 11. Plant recommended trees
☐ 12. Harvest trees selectively
☐ 13. Use only for wildlife or recreation area

MECHANICAL
☐ 14. Control brush or trees
☐ 15. Terrace and farm on contour
☐ 16. Maintain terraces
☐ 17. Construct diversion terraces
☐ 18. Install drainage system
☐ 19. Control gullies
☐ 20. No mechanical treatment needed

FERTILIZER AND SOIL AMENDMENTS
☐ 21. Lime
☐ 22. Phosphate (P)
☐ 23. Potash (K)
☐ 24. Nitrogen (N)
☐ 25. Fertilizer or soil amendments not needed.

SCORE PART 1 (Possible 40)____________ SCORE PART 2 (Possible 30)____________ TOTAL SCORE (Possible 70)____________

TRANSPARENCY IV-1-B

SOIL TEXTURAL CLASSES

- **SAND** — DRY: LOOSE AND SINGLE GRAINED; FEELS GRITTY. MOIST: WILL FORM VERY EASILY-CRUMBLED BALL. SAND--85-100%, SILT--0-15%, CLAY--0-10%.

- **LOAMY SAND** — DRY: SILT AND CLAY MAY MASK SAND; FEELS LOOSE, GRITTY. MOIST: FEELS GRITTY; FORMS EASILY-CRUMBLED BALL; STAINS FINGERS SLIGHTLY. SAND--70-90%, SILT--0-30%, CLAY--0-15%.

- **SANDY LOAM** — DRY: CLODS EASILY BROKEN; SAND CAN BE SEEN AND FELT. MOIST: MODERATELY GRITTY; FORMS BALL THAT CAN STAND CAREFUL HANDLING; DEFINITELY STAINS FINGERS. SAND--43-85%, SILT--0-50%, CLAY--0-20%.

- **LOAM** — DRY: CLODS MODERATELY DIFFICULT TO BREAK; MELLOW, SOMEWHAT GRITTY. MOIST: NEITHER VERY GRITTY NOR VERY SMOOTH; FORMS A FIRM BALL; STAINS FINGERS. SAND--23-52%, SILT--28-50%, CLAY--7-27%.

- **SILT LOAM** — DRY: CLODS DIFFICULT TO BREAK; WHEN PULVERIZED FEELS SMOOTH, SOFT AND FLOURY, SHOWS FINGERPRINTS. MOIST: HAS SMOOTH OR SLICK "BUTTERY" OR "VELVETY" FEEL; STAINS FINGERS. SAND--0-50%, SILT--50-88%, CLAY--0-27%.

- **CLAY LOAM** — DRY: CLODS VERY DIFFICULT TO BREAK WITH FINGERS. MOIST: HAS SLIGHTLY GRITTY FEEL; STAINS FINGERS; RIBBONS FAIRLY WELL. SAND--20-45%, SILT-15-53%, CLAY--27-40%.

- **SILTY CLAY LOAM** — SAME AS ABOVE BUT VERY SMOOTH. SAND--0-20%, SILT--40-73%, CLAY--27-40%.

- **SANDY CLAY LOAM** — SAME AS FOR CLAY LOAM. SAND--45-80%, SILT--0-28%, CLAY--20-35%.

- **CLAY** — DRY: CLODS CANNOT BE BROKEN WITH FINGERS WITHOUT EXTREME PRESSURE. MOIST: QUITE PLASTIC AND USUALLY STICKY WHEN WET; STAINS FINGERS. (A SILTY CLAY FEELS SMOOTH, A SANDY CLAY FEELS GRITTY.) SAND--0-45%, SILT--0-40%, CLAY--40-100%.

TRANSPARENCY IV-1-C

SOIL CHARACTERISTICS TO CONSIDER WHEN APPRAISING LAND

PHYSICAL:

1. SOIL TEXTURE
2. SOIL TYPE
3. DEPTH OF SURFACE SOIL AND SUBSOIL
4. DRAINAGE
5. SLOPE
6. EROSION

SOURCES OF INFORMATION:

1. SOIL CONSERVATION SERVICE
    - A. FARM CONSERVATION PLAN
    - B. AERIAL PHOTOGRAPHS
    - C. SOIL SURVEY REPORTS

2. PERSONAL OBSERVATION

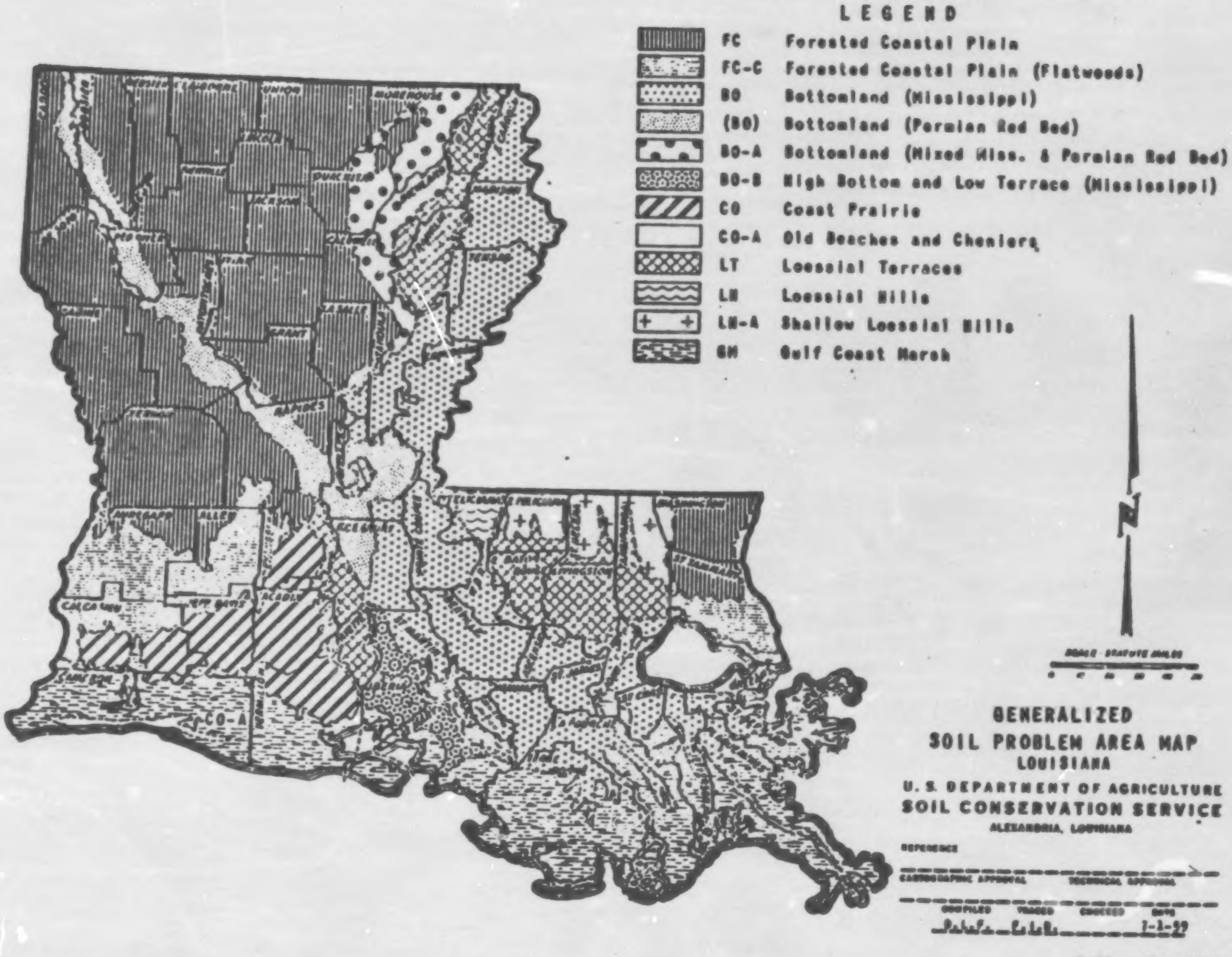
TRANSPARENCY IV-1-D

GENERAL GROUPING OF SOIL TEXTURAL CLASSES
(USDA CLASSIFICATION)

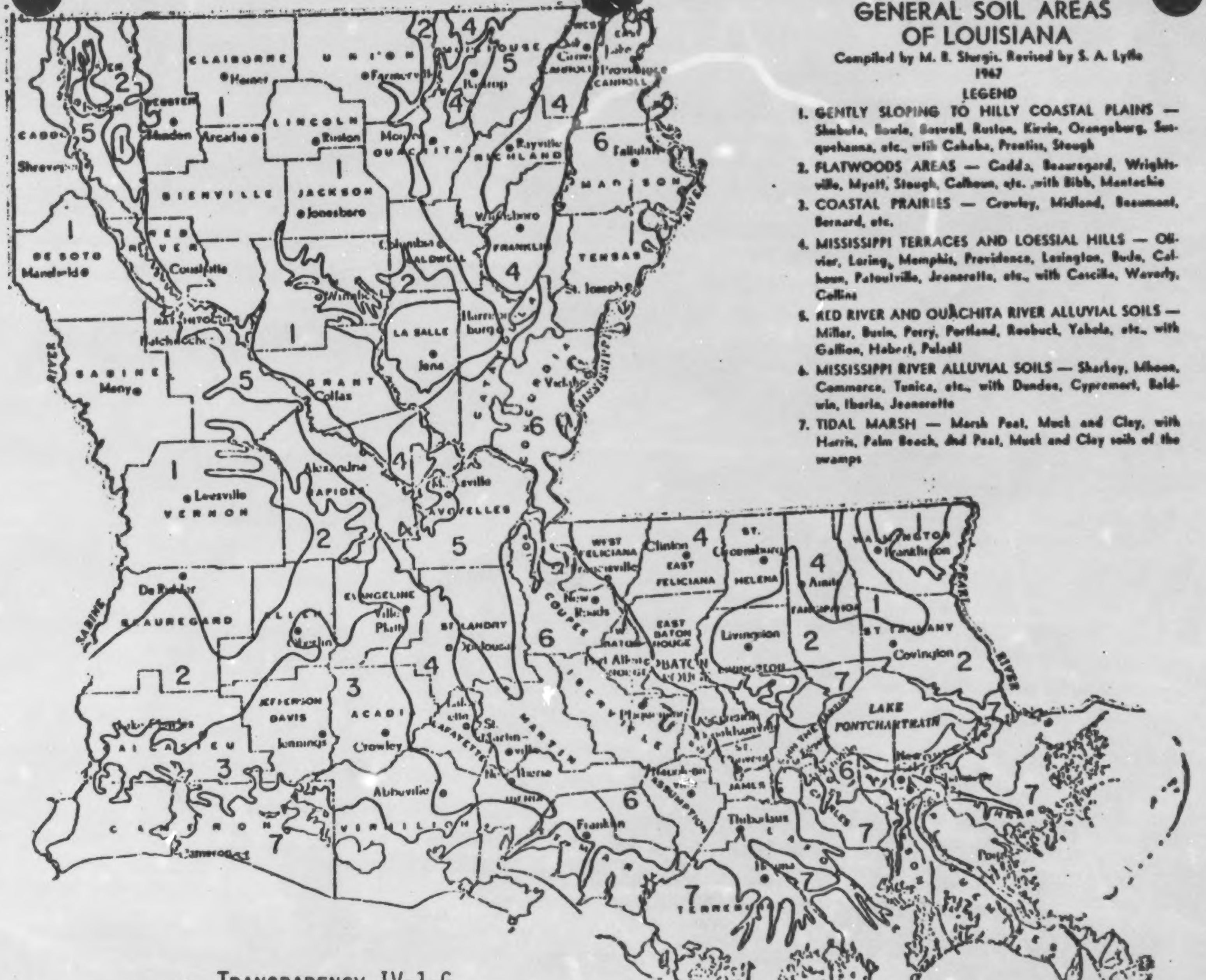
First Grouping	Second Grouping	Basic Soil Textural Class Names
(I) Sandy Soil	(1) Coarse-Textured Soil	Sand Loamy Sand
(II) Loamy Soil	(2) Moderately Coarse-Textured Soil	Sandy Loam Fine Sandy Loam
	(3) Medium-Textured Soil	Very Fine Sandy Loam Loam Silt Loam Silt
	(4) Moderately Fine-Textured Soil	Clay Loam Sandy Clay Loam Silty Clay Loam
(III) Clayey Soil	(5) Fine-Textured Soil	Sandy Clay Silty Clay Clay

The above classification permits classifying soils first into three general groups as (I) Sandy Soil, (II) Loamy Soil, and (III) Clayey Soil. The second grouping of five general classes is (1) Coarse-Textured Soil, (2) Moderately Coarse-Textured Soil, (3) Medium-Textured Soil, (4) Moderately Fine-Textured Soil, and (5) Fine-Textured Soil. The basic soil textural classes fall in the further general groupings shown above.

Transparency IV-1-E


LEGEND
FC Forested Coastal Plain
FC-C Forested Coastal Plain (Flatwoods)
BO Bottomland (Mississippi)
(BO) Bottomland (Permian Red Bed)
BO-A Bottomland (Mixed Miss. & Permian Red Bed)
BO-B High Bottom and Low Terrace (Mississippi)
CO Coast Prairie
CO-A Old Beaches and Cheniers
LT Loessial Terraces
LH Loessial Hills
LH-A Shallow Loessial Hills
GM Gulf Coast Marsh
UNION
MOREHOUSE
GRANT
RAPIDES
CO-A
N
SCALE - STATUTE MILES
GENERALIZED
SOIL PROBLEM AREA MAP
LOUISIANA
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ALEXANDRIA, LOUISIANA
REFERENCE
CARTOGRAPHIC APPROVAL
TECHNICAL APPROVAL
COMPILED
TRACED
CHECKED
DATE
7-1-59
7-59
4-L-13568

TRANSPARENCY IV-1-F


CLAIBORNE
UNION
MOREHOUSE
WEST CARROLL
EAST CARROLL
CADDO
Shreveport
WEBSTER
Minden
Homer
Farmerville
Bastrop
Lake Providence
BIENVILLE
LINCOLN
Ruston
Arcadia
Monroe
OUACHITA
Rayville
RICHLAND
Tallulah
MADISON
JACKSON
Jonesboro
DE SOTO
Mansfield
RED RIVER
Coushatta
Columbia
CALDWELL
Winnsboro
FRANKLIN
TENSAS
St. Joseph
Winnfield
NATCHITOCHES
Natchitoches
LA SALLE
Jena
Harrisonburg
SABINE
Many
GRANT
Colfax
Vidalia
CONCORDIA
MISSISSIPPI RIVER
SABINE RIVER
Alexandria
RAPIDES
Marksville
AVOYELLES
VERNON
Leesville
DeRidder
BEAUREGARD
EVANGELINE
Ville Platte
ST. LANDRY
Opelousas
ALLEN
Oberlin
WEST FELICIANA
St. Francisville
POINTE COUPEE
New Roads
EAST FELICIANA
Clinton
ST. HELENA
Greensburg
Amite
TANGIPAHOA
WASHINGTON
Franklinton
LIVINGSTON
Livingston
ST. TAMMANY
Covington
PEARL RIVER
EAST BATON ROUGE
BATON ROUGE
Port Allen
IBERVILLE
JEFFERSON DAVIS
Jennings
ACADIA
Crowley
Lake Charles
CALCASIEU
LAFAYETTE
ST. MARTIN
St. Martinville
New Iberia
IBERIA
Abbeville
VERMILION
CAMERON
Cameron
ST. MARY
Franklin
ASSUMPTION
Napoleonville
ST. JAMES
Thibodaux
LAFOURCHE
Houma
TERREBONNE
LAKE PONTCHARTRAIN
New Orleans
ST. BERNARD
PLAQUEMINES
1
2
3
4
5
6
7

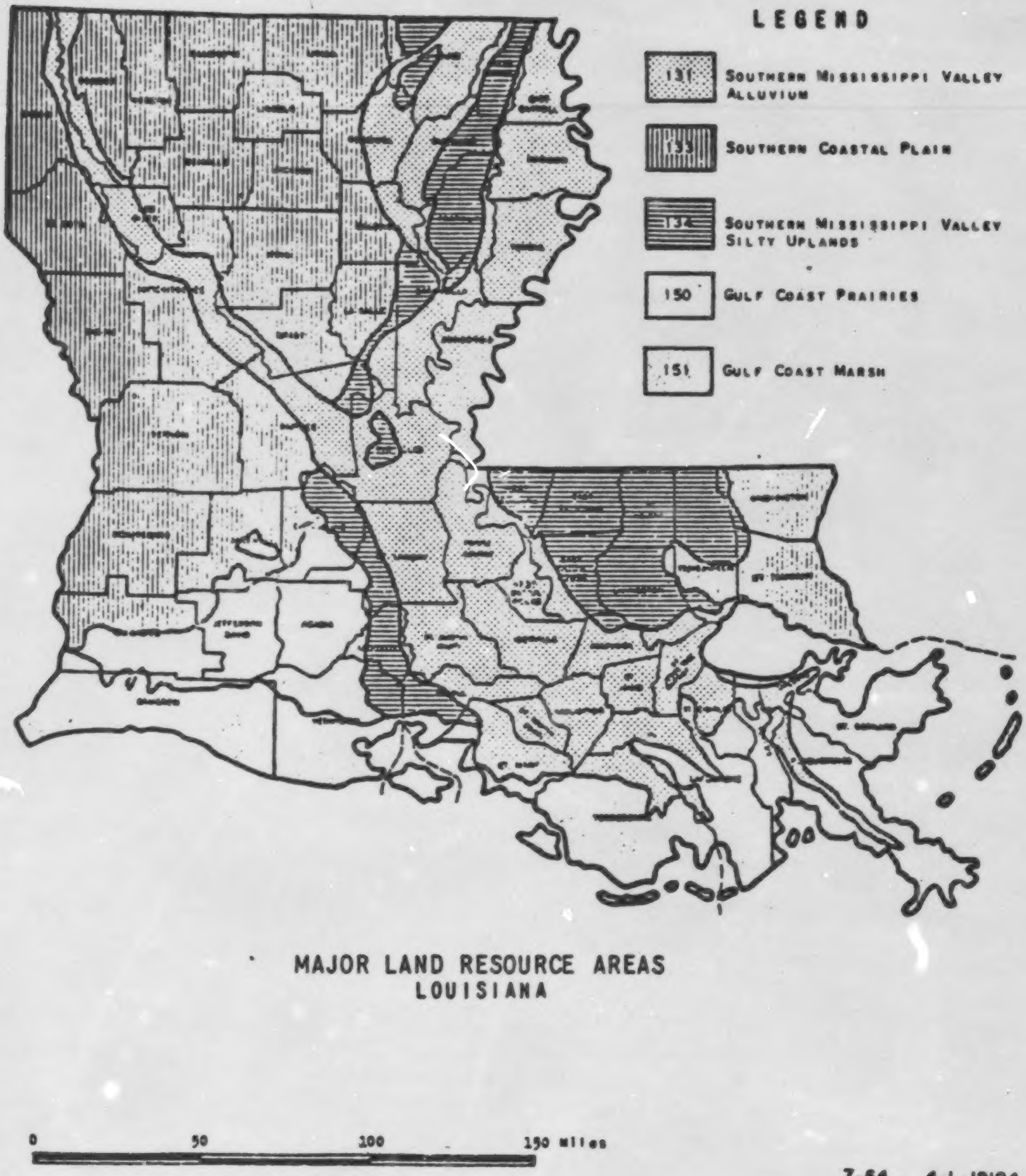
GENERAL SOIL AREAS OF LOUISIANA

Compiled by M. B. Sturgis. Revised by S. A. Lytle
1967

LEGEND

1. GENTLY SLOPING TO HILLY COASTAL PLAINS — Shubuta, Bowie, Boswell, Ruston, Kirvin, Orangeburg, Susquehanna, etc., with Cahaba, Prentiss, Stough
2. FLATWOODS AREAS — Caddo, Beauregard, Wrightsville, Myatt, Stough, Calhoun, etc. ,with Bibb, Mantachie
3. COASTAL PRAIRIES — Crowley, Midland, Beaumont, Bernard, etc.
4. MISSISSIPPI TERRACES AND LOESSIAL HILLS — Olivier, Loring, Memphis, Providence, Lexington, Bude, Calhoun, Patoutville, Jeanerette, etc., with Cascilla, Waverly, Collins
5. RED RIVER AND OUACHITA RIVER ALLUVIAL SOILS — Miller, Buxin, Perry, Portland, Roebuck, Yahola, etc., with Gallion, Hebert, Pulaski
6. MISSISSIPPI RIVER ALLUVIAL SOILS — Sharkey, Mhoon, Commerce, Tunica, etc., with Dundee, Cypremort, Baldwin, Iberia, Jeanerette
7. TIDAL MARSH — Marsh Peat, Muck and Clay, with Harris, Palm Beach, and Peat, Muck and Clay soils of the swamps

TRANSPARENCY IV-1-G


LEGEND
131 Southern Mississippi Valley Alluvium
133 Southern Coastal Plain
134 Southern Mississippi Valley Silty Uplands
150 Gulf Coast Prairies
151 Gulf Coast Marsh

MAJOR LAND RESOURCE AREAS
LOUISIANA

0
50
100
150 miles

Reference Soils Memo SCS-49

7-64 4-L-19104

U. S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, Alexandria, Louisiana

Base 4-L-25779A

TRANSPARENCY IV-1-H

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT V: Soil Fertility and Fertilization

LESSON 1: Nutrient Requirements of Plants

I. Preparation for Instruction

A. Student Objectives

1. Terminal: List the nutrient requirements for plants and indicate the general classification of these nutrients.

2. Specific:

   a. Identify the three groups into which the nutrient requirements of plants may be divided. Give examples of each type.
   b. List the influence of nitrogen, phosphorus, potassium, calcium, magnesium, and sulfur.
   c. Identify and/or describe the deficiency symptoms caused by a lack of nitrogen, phosphorus, potassium, calcium, magnesium, and sulfur.
   d.

   e.

   f.

B. Review Teaching Material

1. Donahue, Roy, L., Roy H. Follett, and Rodney W. Tulloch: Our Soils and Their Management. Danville: Interstate Publishers Inc., 1976.

2. Foth, H.D. and L.M. Turk. Fundamentals of Soil Science. 5th Edition, New York: John Wiley and Sons, Inc., 1972.

3. Knuti, Leo L. and Milton Korge. Profitable Soil Management. 2nd Edition, Englewood

Cliffs, New Jersey: Prentice Hall Hall Inc., 1970.

4. McVickar, Malcom H. and William Walker. Using Commercial Fertilizers. 4th Edition, Danville: Interstate Publishers, 1978.

C. Special Arrangements

Travel

a. Field tour to farms to observe effects of nutrient deficiency on plants.

b. Laboratory demonstration showing effects of lack of nitrogen, phosphorus, and potassium.

II. Presentation of Lesson and Suggested Student Activities

A. Motivation

1. Visit experimental plots where crops are being tested to determine the effects of the lack of different types of fertilizers.

2. List some of the common hunger signs in plants.

3. Discuss economic value of proper fertilization.

B. Content Outline

1. Terms:

   a. Primary nutrients -- these are elements which are needed by plants in large quantities.

   b. Secondary nutrients -- these are elements needed by plants in smaller amounts.

   c. Micronutrients -- (trace elements) these are elements needed by plants in very small amounts.

   d. Essential elements -- those elements necessary for plant growth.

   e. Nutrient -- any element taken in by the plant and used in the manufacture of food and tissue.

   f. Humus -- the well-decomposed part of organic matter.

2. Plant Requirements

   All plants require hydrogen, oxygen, and carbon. These elements are present in the atmosphere and water. However, there are other elements which have to be supplied. They are divided generally into three groups: (Transparency V-1-A)

   a. Primary nutrients
   b. Secondary nutrients
   c. Micronutrients (Trace elements)
   Nutrients enter plants through the root system, leaves, and stems.

   a. Primary Nutrients (nitrogen, phosphorus, and potassium) (Transparency V-1-A)

   Nitrogen and Plant Growth
   Nitrogen influences plant growth in these ways:

   1) Gives a dark green color to all plants.

   2) Increases leaf and stem growth.

3) Aids in seed production of many grasses.

4) Increases the protein content of some food and feed crops.

5) Improves the quality of bread made from wheat.

6) Encourages the growth of grasses in a legume-and-grass mixture.

7) Decreases winter hardiness.

8) Delays maturity, decreases resistance to some insects and diseases, weakens straw, increases water content, and lowers the quality of some fruits and vegetables.

Symptoms of nitrogen deficiencies

1) Sickly, yellowish-green color of foliage,

2) Slow, dwarfed growth, and

3) Drying up of the lower leaves of the plant proceeding upwards as the season advances.

Phosphorus and Plant Growth

Phosphorus reacts on plants in these ways:

1) Stimulates root formation and growth.

2) Hastens maturity.

3) Aids in cell division.

4) Encourages flower development, pollination and seed formation.

5) Increases legume growth.

6) Makes plant more winter hardy.

7) Enables legumes to compete more favorably with grasses.

8) Aids in legume nodule formation.

Symptoms of Phosphorus Deficiencies

1) Slow growth, dwarfed plant.

2) Lower leaves are purple along the margins beginning at the tips. Margins and tips of leaves may eventually die, leaving signs of "firing."

3) In the case of corn, soybeans and small grains, the remainder of the plant has a deep bluish-green or purple cast.

4) Small, slender stalks in the case of corn.

5) Low grain yields, slow to mature.

Potassium and Plant Growth
Potassium affects legumes, grasses, and most other plants in these ways:

1) Imparts plant vigor and resistance to certain diseases.

2) Aids in moving food from the leaves to the roots.

3) Favors the growth of legumes in competition with other plants.

4) Produces stiff stems, and thus reduces lodging.

5) Increases grain plumpness.

6) Imparts winter hardiness.

7) Aids in transformation and translocation of sugars, starches, celluloses, and other carbohydrates.

Symptoms of Potassium Deficiencies

1) Lower leaves scorched on margins and tips

2) Weak stalks, and poor root development cause plants like corn to fall over and lodge.

b. Secondary Nutrients
(Transparency V-1-A)

Calcium and Plant Growth
Calcic limestone added to the soil supplies calcium which serves these functions in the plants:

1) Promotes early root growth.

2) Improves general plant vigor and growth.

3) Encourages grain and seed production.

4) Increases stiffness of the straw in grains.

5) Maintains strength and selective permeability of cell walls.

6) Neutralizes acids produced in plants.

7) Increases the calcium content of food and feed crops.

8) Encourages the nodule formation of legumes.

9) Reduces plant uptake of radioactive elements harmful to humans.

10) Regulates intake of other elements.

Symptoms of Calcium Deficiencies

1) Young leaves at the growing points (tops of the plant) become "hooked" in appearance and die back at the tops and along the margins,

2) Leaves have wrinkled appearance,

3) Young leaves remain folded in some cases, and

4) Roots are short and well-branched roots.

Magnesium and Plant Growth
Magnesium serves these purposes in plant nutrition:

1) Aids in maintaining a dark green color of leaves.

2) Regulates the uptake of other plant nutrients.

3) Acts as a carrier of phosphorus in the plant.

4) Promotes the formation of fats and oils.

5) Plays a part in the movement of starches in the plant.

Magnesium Deficiency Symptoms

1) A general loss of green color which starts in the bottom leaves and later moves up the stalks. The veins of the leaves remain green, causing a striped appearance;

2) Weak stalks with long, branched roots;

3) In corn, definite and sharply defined series of yellowish-green, light yellow, or even white streaks on all leaves throughout entire plant; and

4) Leaves curve upwards along the margins.

Sulfur and Plant Growth

Sulfur functions in plants in these ways:

1) Gives increased root growth.

2) Helps maintain dark green color.

3) Promotes nodule formation on legumes.

4) Stimulates seed production.

5) Encourages more vigorous plant growth.

Sulfur Deficiency Symptoms

1) Young leaves (uppermost leaves) light green in color, having even lighter veins. Entire plant shows a general pale yellow color,

2) Short, slender plants, and

3) Slow, stunted growth.

c. Micronutrient (Trace elements) and Plant Growth

Iron (Transparency V-1-A)

1) Is most important in chlorophyll formation, and

2) Plays a vital role in the activity of enzyme systems.

Iron Deficiency Symptoms

1) Younger or bud leaves affected.

2) Pale to bright yellow color of entire plant, particularly noticeable on new leaves. Leaf margins may "fire."

3) Lower leaves may be striped if deficiency is mild. Leaf veins remain green.

4) Stalks are short and slender.

Manganese

1) Together with iron, assists in the formation of chlorophyll.

2) Is active in carbohydrate formation.

3) Accelerates the germination of seeds and maturity of plants.

4) Affects vitamin content of plants.

Deficiency Symptoms

1) Younger or bud leaves affected,

2) Spots of dead tissue on leaves,

3) Veins remain green; tissue between veins chlorotic, similar to iron deficiency, but the green veins are wider, and

4) Deficiency symptoms in small grain appear as grayish areas near the base of small plants.

Zinc

1) Is essential to the formation of chlorophyll.

2) Influences seed production and grain yield.

3) Is essential in the formation of growth hormones.

Zinc Deficiency Symptoms

1) Older or lower leaves mostly affected,

2) In corn, chlorotic (yellow to white) stripes on each side of the midrib, especially on the lower and middle leaves of the plant. Some leaves show distinct light and dark green stripes,

3) Slow, stunted growth, and

4) In beans, slow stunted growth; general yellowing of the upper foliage with a browning or bronzing of the older or lower leaves.

Copper

1) Acts as a regulator of several biochemical processes that occur in the plant.

2) In excess, is toxic to plants.

Copper Deficiency Symptoms

1) In corn, the entire plant pales and the youngest leaves turn yellow.

2) Younger part of plants are affected first and die back is typical.

Boron

1) Is essential for pollination and reproduction.

2) Influences flower and seed formation.

3) Influences oxygen supply to plant tissues and roots.

4) Is closely related to calcium performance in plants.

5) In excess is toxic to plants.

Boron Deficiency Symptoms

1) Younger or bud leaves affected,

2) Young leaves light green color,

3) Terminal bud or growing point usually dies after distortion at tips and bases of young leaves, and

4) Fails to set seed. High degree of barren stalks in corn.

Chlorine
May prevent some types of wilting and chlorosis.

Chlorine Deficiency Symptoms
Wilting, chlorosis.

Molybdenum

1) Is essential for the rhizobia bacteria that live in nodules on legume roots.

2) Influences the reduction of nitrate in protein synthesis.

3) Is instrumental in starch, amino acid and vitamin formations.

4) In excess is toxic to plants.

Molybdenum Deficiency Symptoms

1) In oats, bluish coloration of outer seed covering (glumes),

2) In legumes, older leaves are pale greenish yellow to yellow, and 93

3) Plants dwarfed.

C. Suggested Student Activities

1. Grow plants in flats and pots, using sterile sand to show the effect of deficiencies.

2. Collect labels from fertilizer containers and compare the plant food elements in each. (Transparency V-1-B)

D. Suggested Study Guide Questions

1. Define the term nutrient.

2. Give the three groups into which the nutrient requirements of plants may be divided.

3. Name the primary nutrients.

4. Name the secondary nutrients.

5. Name the micronutrients.

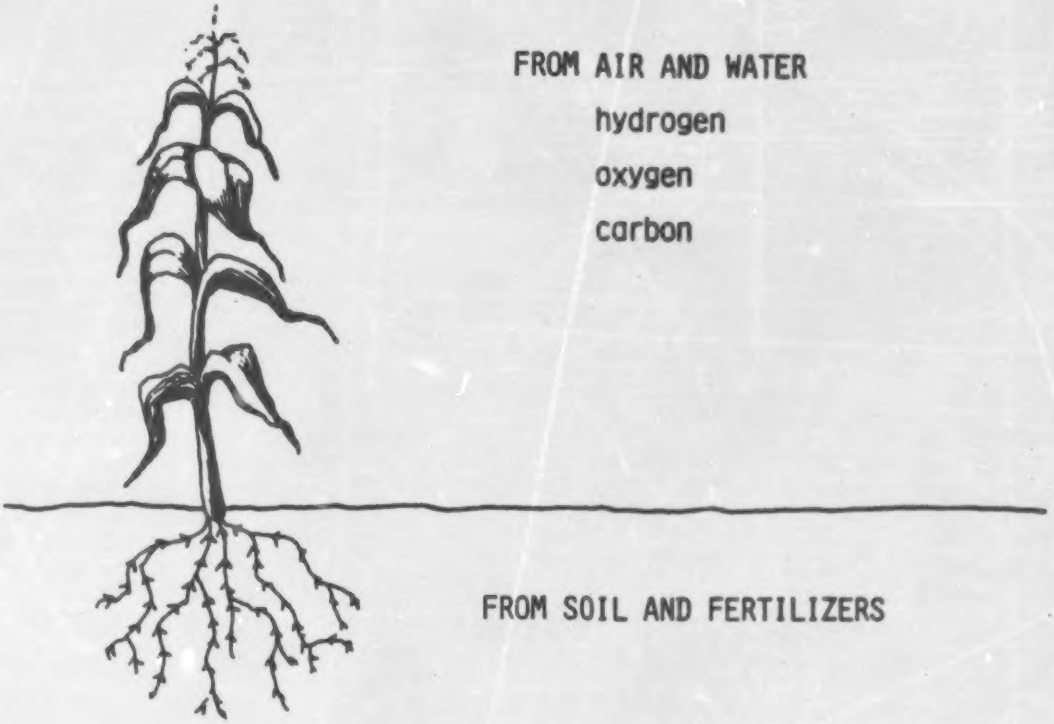
6. List the symptoms of the following nutrient deficiencies:

   a. Nitrogen
   b. Phosphorus
   c. Potassium
   d. Calcium
   e. Magnesium
   f. Sulfur
   g. Iron
   h. Manganese
   i. Zinc
   j. Copper
   k. Boron
   l. Chlorine
   m. Molybdenum

7. Name the three water/air nutrients.

8. Name the major effects that each plant nutrient has on growth and development.

WHERE A PLANT GETS ITS NUTRIENTS



FROM AIR AND WATER

- hydrogen
- oxygen
- carbon

FROM SOIL AND FERTILIZERS

PRIMARY NUTRIENTS	SECONDARY NUTRIENTS
nitrogen	magnesium
phosphorus	calcium
potassium	sulphur

MICRONUTRIENTS

manganese
copper
chlorine
molybdenum

zinc
iron
boron

TRANSPARENCY V-1-A

TRACE ELEMENTS (NUTRIENTS)

COPPER
MANGANESE
BORON
MOLYBDENUM
ZINC
IRON
CHLORINE

MIXED FERTILIZER
(SUPPLIES MORE THAN ONE NUTRIENT)

EXAMPLE: COMPLETE FERTILIZER

RATIO OF 1 — 2 — 1 MAY BE 5 — 10 — 5

100 lbs. OF 5 — 10 — 5 IS

5% OR 5lbs. NITROGEN

10% OR 10 lbs. PHOSPHORIC ACID

5% OR 5 lbs. POTASH

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT V: Soil Fertility and Fertilization

LESSON 2: Organic and Inorganic Fertilizers

I. Preparation for Instruction

A. Student Objectives

1. Terminal: List the sources of organic and inorganic fertilizers and the differences between them.

2. Specific:

a. List some sources of inorganic fertilizers.
b. List some sources of organic fertilizers.
c. List the main plant nutrients supplied by inorganic and organic fertilizers.
d. Compare the advantages and disadvantages of organic and inorganic fertilizers.
e. Give an example of a multinutrient fertilizer.
f. Explain how plants obtain carbon, oxygen, hydrogen, nitrogen, phosphorus, and potassium.
g. Differentiate between a fertilizer grade and a fertilizer analysis.
h. Explain the fertilizer ratio of a 5-10-5 grade.
i. Explain where most of the nitrogen in the soil is derived.
j. Describe the nitrogen cycle.
k. Explain where the energy comes from to carry out the nitrogen transformations.
l. Name one common type of bacteria that is involved in the nitrogen cycle.
m. Discuss the symbiotic relationship between bacteria and plants.
n. Specify where the bacteria are located in the root of the plants.
o. Discuss nitrogen fixation.

B. Review Teaching Material

1. Donahue, Roy L., Roy H. Follett and Rodney W. Tulloch. *Our Soils and Their Management*. Danville: Interstate Publishers, 1976.

2. Foth, H.D. and L.M. Turk. *Fundamentals of Soil Science*. 5th Edition, New York: John Wiley and Sons, Inc., 1972.

3. Kunti, Leo L. and Milton Korge. *Profitable Soil Management*. 2nd Edition, Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1970.

C. Special Arrangements

1. Travel

   a. Field tour to farms to observe use of commercial fertilizer.

   b. Field tours to farms to observe different types of organic materials and leguminous plants.

   c. Field tours to farms to observe how crop residues are being managed.

II. Presentation of Lesson and Suggested Student Activities

A. Motivation

1. Display to class samples of various inorganic and organic fertilizers.

2. Compare the roots of leguminous and nonleguminous plants, and at the same time point out the nodules which are present on the roots of the leguminous plants.

B. Content Outline

1. Terms

a. Acid-forming fertilizer -- one that is capable of increasing the residual acidity of soil.

b. Analysis -- as applied to fertilizers, designates the actual percentage composition of the product as determined by a laboratory analysis.

c. Brand Name -- a specific patented designation applied to a specific fertilizer.

d. Bulk fertilizer -- commercial fertilizer delivered to the purchaser in solid or liquid state, in a non-packaged form.

e. Grade -- the minimum guarantee of plant-nutrient content of fertilizer expressed as whole percentage numbers of total nitrogen (N) available phosphoric acid (P_2O_5) and water-soluble potassium (K_2O) respectively.

f. Non-acid forming fertilizer -- one that is not capable of increasing the residual acidity of the soil.

g. Organic fertilizer -- organic fertilizer materials that are not soluble in water.

h. Ratio -- the relative proportion of N, P_2O_5, and K_2O in a fertilizer grade divided by the highest common divisor.

i. Fertilizer -- any organic or inorganic material of natural or synthetic origin which is applied to the soil to supply soil nutrients.

j. Complete fertilizer -- a fertilizer material containing nitrogen, phosphorus, potassium, and possibly some trace elements.

k. Nitrification -- the process by which nitrates are formed from ammonia.

97

1. Denitrification -- the method by which nitrates are reconverted to ammonia or atmospheric nitrogen.

2. Fertilizers

   a. Fertilizers increase soil fertility and provide a means of maintaining high soil fertility levels.

   b. They replace nutrients removed from soil by harvested crops.

   c. Each bag of fertilizer includes chemical compounds that contain one or more of the 16 essential elements.

   d. A fertilizer containing one or more of the three major plant food elements, nitrogen, phosphorus and potassium, is designated by a numbering system that states the percentage of each element in the mixture. These figures are the guarantee in whole numbers of the fertilizer.

   e. Grade is expressed as a set of three numbers, such as 13-13-13, 16-8-8.

   f. The number 13-13-13 on a fertilizer bag means that the manufacturer guarantees that it contains 13% total nitrogen, 13% available phosphate, and 13% water soluble potassium.

   g. The remaining 61% of the product consists of other elements, such as calcium, chlorine, oxygen, and inert materials.

3. Nitrogen Fertilizers

   a. Pure nitrogen must be combined with other elements before it can be used as a fertilizer.

   b. Nitrogen is quickly exhausted from our soils by erosion, leaching, and harvested crops.

   c. Nitrogen must be replaced frequently to maintain soil productivity.

d. Many different chemical and physical forms of nitrogen fertilizers are available.

e. The grade, chemical form, physical form, and recommended method of applying the important sources of nitrogen are presented in Table I.

4. Nitrogen Cycle (Transparency V-2-A)

   a. Some bacteria can take free nitrogen from the soil and air, and use it in building their cells.

   b. Thus the free nitrogen is brought into a fixed form.

   c. The nitrogen-rich cell materials of bacteria eventually become a source of nitrogen for the farmer's crop.

   d. The process of changing nitrogen from the air into nitrogen compounds by soil bacteria is called nitrogen fixation.

   e. Bacteria which are capable of nitrogen fixation are of two groups.

   f. One group is attached to the root of legumes.

   g. The second group live in the soil independent of plants.

   h. These are called free nitrogen-fixing bacteria.

   i. Some soluble nitrogen compounds may be passed out by bacteria during their growth.

   j. A definite source of nitrogen for higher plants is the dead bacteria cess materials which are decomposed or broken down into a form which plants can use.

   k. This breaking down process is called mineralization of nitrogen.

   l. The most important group of nitrogen-fixing bacteria are the rhizobia which causes nodules to form on the roots of legumes.

m. Plants absorb the nitrogen collected in the nodules.

n. Some may be excreted from the nodules into the soil.

o. When a legume plant is grown for the first time, it is essential to inoculate the soil with the proper bacteria.

p. This is usually done by inoculating the seed at planting time.

q. Inoculating materials can be purchased at most seed stores.

r. The cost of inoculation is small compared with the possible benefits.

s. Soils most lacking in available nitrogen profit most from the nitrogen-fixing bacteria.

t. Soil scientists estimate the increases in soil nitrogen by the bacteria, which live in the soil independent of higher plants, to be 10 to 50 pounds per acre per year.

u. All crop plants can profit from this source of nitrogen.

v. Plowing down a legume green manure crop adds to the total supply of nitrogen in the soil.

5. Legumes

a. Legumes inoculated with the proper strain of nodule-forming bacteria use atmospheric nitrogen. (Transparency V-2-B)

b. Most legumes fix all the nitrogen they need and thus do not need nitrogen fertilizer after the plants have become established.

c. Many legumes also supply substantial amounts of nitrogen to the succeeding crop.

6. Slow-Release Nitrogen Fertilizer

   a. The nitrogen in most chemical fertilizers is readily soluble and available for use by plants; however, plants need nitrogen daily.

   b. This situation stimulated the development of slowly available forms of nitrogen fertilizer such as urea-formaldehyde and sulfur coated urea.

   c. Slow release nitrogen fertilizers are especially useful on sandy soil for turf grasses and speciality crops.

7. Phosphorous Fertilizer

   a. Phosphate assists in cell division and in the formation of fats and proteins.

   b. It is concentrated in the seeds and fruits of plants and hastens their development.

   c. Rock phosphate is the source of nearly all phosphorus fertilizers soil in the U.S.

   d. Most of the phosphate fertilizer that is applied to soil is converted to insoluble compounds of iron and aluminum phosphate.

   e. Phosphorus not absorbed in the year of application is gradually released over several years.

   f. Responses up to five years after application are not uncommon.

   g. Super phosphate is the most widely used phosphate fertilizer.

8. Potassium Fertilizer

   a. Many soils are lacking in available potassium, even though the average plow layer contains 40,000 pounds per acre.

b. Muriate of potassium contains 60-62 percent soluble potassium.

c. This is the most important potassium carrier in the U.S.

d. However, the chlorine content of this fertilizer is thought to be injurious to some crops.

9. Multinutrient Fertilizer

a. Multinutrient fertilizer refers to any fertilizer containing two or more plant nutrients.

b. Multinutrient fertilizers may be solid or liquid.

c. The most common classes of multinutrient fertilizers are:

1) Granulated formulations

2) Bulk blends

3) Liquid formulation fertilizers

4) Suspensions

5) Slurries

10. Animal Manure and Organic Fertilizer

a. Animal manure contains considerable quantities of plant nutrients which can be used to supplement or replace nutrients supplied through fertilizer materials.

b. Other possible sources of nutrients include urban wastes such as sewage, sludge, garbage, and plant waste products or crops.

c. Refer to Table II.

11. Calculation of Fertilizer Cost

The cost per pound of nitrogen in straight fertilizer materials can be determined as follows:

$$\frac{\text{Price/Ton}}{\text{\% nutrient} \times 20} = \text{Cost/lb. of N}$$

For example if we assumed that ammonium nitrate (33.5-0-0) sold for \$147.40 per ton, then the cost per lb. would be

$$\frac{\$147.40}{33.5\% \times 20} = 22¢/\text{lb. of N}$$

C. Suggested Student Activity

1. Make a study of the amounts and kinds of commercial fertilizer used locally.
2. Determine the need for use of commercial fertilizer on local farms.
3. Make a comprehensive list of all types of organic materials that are used in your parish to maintain or increase organic matter in soils.
4. Visit a local farm to see how crop residues are being managed.
5. Collect, list, and examine the roots of leguminous plants to observe nodules containing nitrogen-fixing bacteria.
6. List rotation plan followed by most farms utilizing legumes.

D. Suggested Study Questions

1. Define fertilizer.
2. Define a complete fertilizer.
3. Explain what a 13-13-13 fertilizer contains.
4. What is meant by inert material?
5. Define leaching.
6. Why does nitrogen need to be replaced frequently?
7. What are some common nitrogen fertilizer sources applied as liquids?
8. What are some common nitrogen fertilizer sources applied in the granular or prill form?

103

9. List some sources of phosphorous.

10. List two sources of potassium.

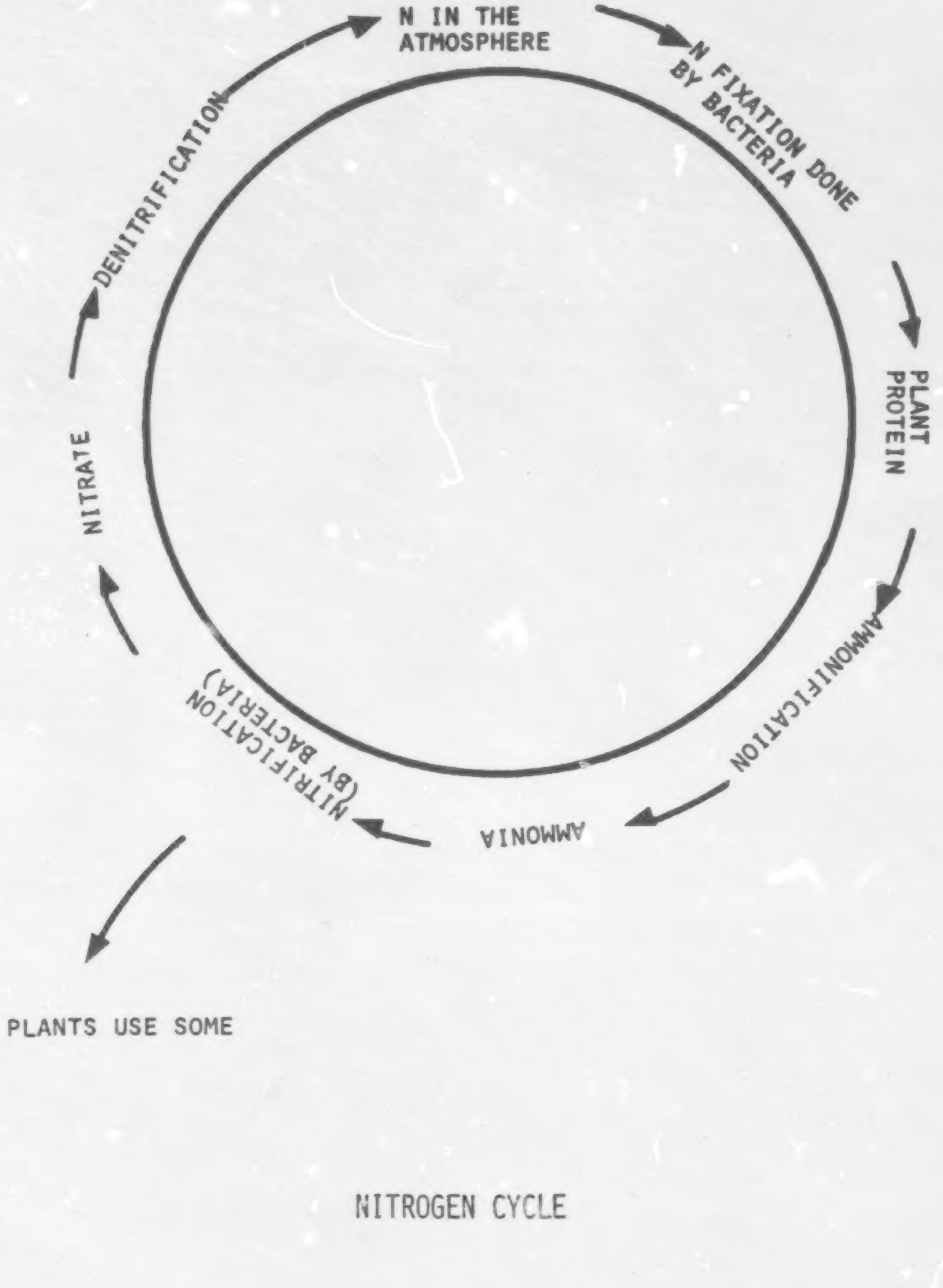
11. Define a legume.

12. Illustrate the nitrogen cycle.

13. How do the nitrogen requirements of legumes differ from other plants?

14. What is the most important group of nitrogen-fixing bacteria?

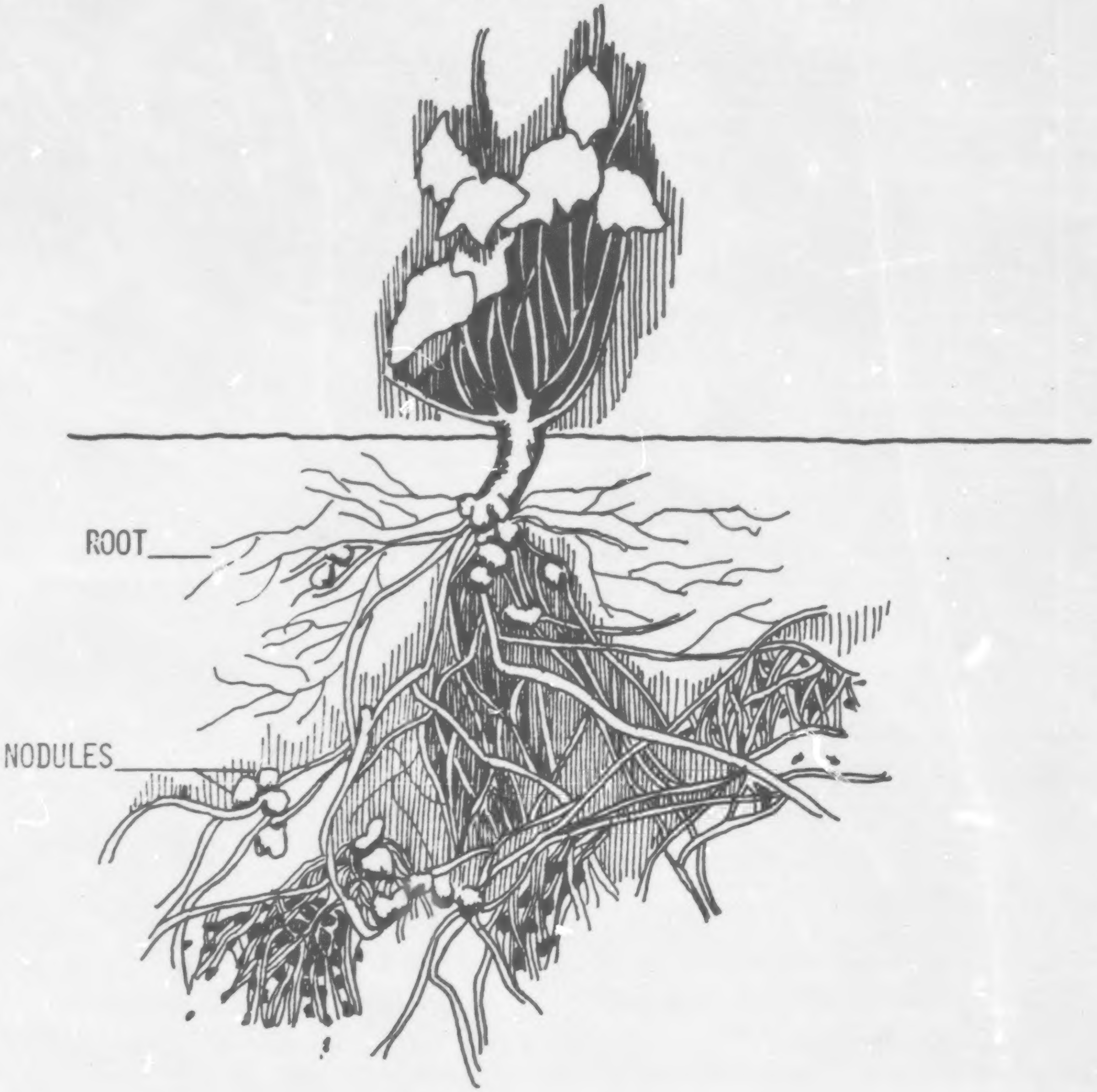
15. What are some sources of organic fertilizers?


N IN THE ATMOSPHERE
N FIXATION DONE BY BACTERIA
PLANT PROTEIN
AMMONIFICATION
AMMONIA
NITRIFICATION (BY BACTERIA)
NITRATE
DENITRIFICATION
PLANTS USE SOME

NITROGEN CYCLE

TRANSPARENCY V-2-A

LEGUME PLANT (NITROGEN FIXATION)


ROOT
NODULES

TRANSPARENCY V-2-B

Table 1

Sources of Nitrogen Fertilizer, Grade, Chemical and Physical Form, and Method of Application

Fertilizer	Chemical Formula	Grade ($N-P_2O_5-K_2O$)	Physical Form	Method of Application
Anhydrous Ammonia	NH_3	82- 0- 0	High Pressure Liquid	Must be injected 6-8" (15-20 cm) deep in fiable, moist soil.
Nitrates:				
Ammonium Nitrate	NH_4NO_3	33- 0- 0	Dry Prills	Broadcast or sidedress. Can be left on the soil surface.
Potassium Nitrate	KNO_3	13- 0-44	Dry Granules	Broadcast or apply in the row. Can be left on the soil surface.
Sulfates:				
Ammonium Sulfate	$(NH_4)_2SO_4$	20- 0- 0	Dry Granules	Broadcast or Sidedress. Can be left on the soil surface.
Phosphates:				
Ammonium Phosphate Solutions		10-34- 0 11-37- 0	Pressureless Liquid	Spray on surface or sidedress. Incorporate surface application to prevent volatilization loss of NH_3.
Urea	NH_2CONH_2	45- 0- 0	Dry Prills	Broadcast or sidedress. Incorporate surface application to prevent volatilization loss of ammonia from the urea.

Source: L. M. Walsh. Soil and Applied Nitrogen. The University of Wisconsin, Ext. Fact Sheet A 2519.

Table 2

Primary Nutrients Contained in Organic Fertilizers

(Average Analysis of Fertilizers Without Losses From Leaching or Decomposition)

		Percent Nitrogen (N)	Percent Phosphorus (P)	Percent Potassium (K)
		Dry Weight Basis		
Bulky Organic Materials				
Hays:	Alfalfa Hay	2.5	0.2	1.7
	Alfalfa Straw	1.5	0.1	1.3
	Bean Straw	1.2	0.1	1.0
	Grain Straw	0.6	0.1	0.9
Manures:	Cattle Manure	2.0	1.0	2.0
	Hog Manure	2.0	0.6	1.5
	Horse Manure	1.7	0.3	1.5
	Poultry Manure	4.3	1.6	1.6
	Sheep Manure	4.0	0.6	2.9
Miscellaneous:	Cotton Bolls	1.0	0.1	3.3
	Peanut Hulls	1.5	0.1	0.7
	Sawdust & Wood Shavings	0.2	0.0	0.2
	Seaweed (Kelp)	0.6	0.0	1.1
Organic Concentrates				
Tankage:	Animal Tankage	9.0	4.4	1.3
	Garbage Tankage	2.5	0.7	2.3
Meals:	Bone Meal	4.0	10.1	0.0
	Cottonseed Meal	6.0	1.1	2.3
	Dried Blood	13.0	0.7	0.7
	Fish Meal	10.0	2.6	0.0
	Soybean Meal	7.0	0.5	2.3
	Steamed Bone Meal	0.8	13.0	0.0
	Wood Ashes	0.0	0.9	5.0

Source: Let's Take a Closer Look at Organic Gardening, Ext. Bul. 555, The Ohio State University.

Information Sheet

V-2-A

Determining Nutrient Cost in Straight Fertilizers

When purchasing fertilizer, the two most important things on the label to consider are the net weight and the grade (guaranteed analysis). Fertilizer prices should be compared on the basis of cost pet pound of nutrients rather than cost per ton of material. The cost per pound of N, P_2O_5, or K_2O in straight fertilizer materials can be determined as follows:

$$\frac{\text{Price/ton}}{\%\ \text{nutrient} \times 20} = \text{Cost/lb. of nutrient}$$

For example, if we assume that ammonium nitrate (33.5-0-0) sold for $147.40 per ton, then the cost per pound would be:

$$\frac{\$147.40}{33.5\% \times 20} = 22\ \text{cts./lb. of N}$$

If concentrated superphosphate (0-45-0) sold for $162.00 per ton, then the cost per pound would be:

$$\frac{\$162.00}{45\% \times 20} = 18\ \text{cts./lb. of } P_2O_5$$

And muriate of potash (0-0-60) selling for $96.00 per ton would cost per pound:

$$\frac{\$96.00}{60\% \times 20} = 8\ \text{cts./lb. of } K_2O$$

Determining Comparative Costs of Multinutrient Fertilizers

Once the cost per pound of N, P_2O_5, and K_2O in straight fertilizers has been determined, their relative cost in mixed fertilizer can be compared as follows:

$$\begin{gathered}\%\ N \times \text{cost/lb. N}) + (\%\ P_2O_5 \times \text{cost/lb. } P_2O_5) \\ + (\%\ K_2O \times \text{cost/lb. } K_2O) = \text{Cost/100 lb.} \times 20 = \text{Cost/ton}\end{gathered}$$

For example, if we assumed that a 5-20-20 analysis fertilizer sold for $135.00 per ton, then the cost could be compared as follows:

$$\begin{gathered}5\%\ N \times 22\ \text{cts./lb. N}) + (20\%\ P_2O_5 \times 18\ \text{cts./lb.}) \\ + (20\%\ K_2O \times 8\ \text{cts./lb.}) = \$6.30/100\ \text{lb.} \times 20 = \$126/\text{ton}\end{gathered}$$

Thus, by this technique the cost of various mixed fertilizers can be compared on the basis of the cost per pound of nutrient.

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT V: Soil Fertility and Fertilization

LESSON 3: Application of Fertilizers

I. Preparation for Instruction

A. Student Objectives

1. Terminal: List and discuss the proper time fertilizer should be applied, methods of application, and the value of fertilizer in plant production.

2. Specific:

a. Explain the economic factors a farmer should take into consideration in buying fertilizers.
b. Give the methods of applying solid and liquid fertilizers.
c. Explain the purpose of the different placements of fertilizer in the soil, and the relation these placements have to the seed and the growing plant.
d. List the ways fertilizer benefits crop production.
e.

f.

g.

B. Review Teaching Materials

1. Donahue, Roy L., Roy H. Follett, and Rodney W. Tulloch. Our Soils and Their Management. Danville: Interstate Publishers 1976.

2. Foth, H.D. and L.M. Turk. Fundamentals of Soil Science. 5th Edition, New York: John Wiley and Sons, Inc., 1972.

105 3. Kunti, Leo L. and Milton Korge. Profitable Soil Management. 2nd Edition, Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1970.

4. Louisiana Cooperative Extension bulletins -- fertilizer recommendations.

C. Special Arrangements

1. Materials

a. Six flower pots of at least one gallon capacity.

b. Soil sample

c. One pound of 10-10-10 fertilizer

d. Seed of corn, grain, soybean, or other common crop in area.

e. Greenhouse

2. Travel

a. Field trip to a farm to observe different methods of fertilizer application.

b. Field trips to fertilizer dealers to determine the need for commerical fertilizer on local farms.

II. Presentation of Lesson and Suggested Student Activities

A. Motivation

1. Visit to various neighboring farms to observe some of the methods that farmers use in applying fertilizer.

2. Discuss with the students how they apply fertilizer to their plants.

B. Content Outline

1. Terms

   a. Deep drilling -- the placing of fertilizer in bands at selected depths.

   b. Top dressing -- the application of fertilizer on top of the soil after plant growth has started.

   c. Side dressing -- the application of fertilizer on the side of the rows after crop growth has started.

2. Content

Fundamentals of Fertilizer Application

Soil test indicates the relative fertility level of the soil. Where the fertility levels of the soil is low, fertilizers must furnish a major portion of the nutrients needed by the crops. Maintaining soil fertility at medium or high levels is a desirable long-term soil fertility goal.

Amount of Fertilizer to Apply

The amount of fertilizer to apply depends on the following:

a. Soil tests.

b. Past experience with fertilizers.

c. Fertility requirements of the crop.

d. Nature of the soil.

e. Crop to be grown.

f. Analysis of the fertilizer used.

g. Value of the crop.

Consult Cooperative Extension publications for general fertilizer recommendations for major crops, vegetable gardens, and greenhouse/nursery operations.

Time of Fertilizer Application

Fertilizer is applied to stimulate plant growth. The nearer the time of application to the time the nutrient will be used by the crop the better. To get the maximum fertilizer efficiency, frequent small applications may be desirable even though frequent applications are expensive. With many crops there may be only one season when an application can be made. For annual crops the fertilizer application is frequently at or near seeding time.

3. Fertilizer Application (Transparency V-3-A)

   Fertilizer should be applied so that:

   a. Growing plants can use the fertilizer efficiently.

   b. There is little or no injury to plants from fertilizers.

   c. The application can be accomplished as quickly and easily as economically possible.

4. Methods of Application

   a. Broadcast Applications

      This refers to the spreading of fertilizer by use of spreader.

      1) Advantages include:

         a) Large amounts of fertilizer can be used without danger of plant injury.

         b) Labor and time are saved.

         c) Planting operations are speeded up because time-consuming fertilizer placement equipment is eliminated.

         d) Bulk fertilizer is generally more economical.

2) Disadvantages include: 108

a) The possibility of soil phosphorus fixation is increased.

b) There is a dilution effect on the fertilizer applied.

c) The possibility of weed competition is increased.

b. Side Dressing

1) Side dressing is one way to apply additional nitrogen to the plants.

2) The fertilizer is applied in bands 3 to 4 inches (8 - 10 cm) below the surface of the soil in the middle of the rows.

3) The advantage of side dressing is that the fertilizer can be applied close to the time of greatest need of the plant.

4) This is a good method of applying nitrogen in sandy soils.

5) The disadvantage of this method is that wet soil may prevent timely application, and when the weather is dry, after side dressing, the roots may not be able to absorb the nitrogen if it is placed above the root absorption zone.

c. Row Placement

1) This involves placing the fertilizer to one side and below the level of the seed.

2) The main advantage is that it supplies readily available fertilizer to the plant, enabling it to grow faster.

3) The disadvantages of row placement are:

a) The hazard of fertilizer injury occurs when large amounts are placed too close to the plant.

        b) Time and labor involved are high.

    d. Foliar Applications

        1) Foliar sprays of the primary plant nutrients are seldom practical because of the large amounts needed and their higher cost.

        2) Micronutrients and some of the secondary nutrients can be satisfactorily applied in solutions to the foliage since only small amounts are needed.

    e. Soil Injection

        1) Anhydrous ammonia, a liquid under pressure and a gas in the atmosphere, must be injected in the soil.

        2) Anhydrous ammonia application is easy to combine with other tillage operations such as plowing, disking, and planting.

5. Fertilizer Forms

    a. Solids -- Most solid forms of fertilizer are granulated or pelleted for easy application and resistance to caking. They must be kept dry to minimize caking that will occur in damp storage areas.

    b. Liquids -- Liquid fertilizers may be sprayed or dribbled on the surface from a boom fed by the reservoir tank. They may also be distributed with irrigation water by injecting it into the water a little ahead of the location where water-spreading starts.

    Liquid fertilizers are corrosive and equipment must be protected. It is essential that corrosive resistant materials and equipment be used.

    Ammonium nitrate and urea are examples of commonly used liquid fertilizers.

c. Gases -- Frequently ammonia gas is added to liquid fertilizers. This gas is volatile. These materials must be injected into the soil to a depth of two inches by passing the solution into the soil through a "shoe" similar to that used on a seed drill. This minimizes gas loss.

C. Suggested Student Activities

1. Arrange for demonstrations of different methods of fertilizer application.
2. Survey the kinds and amounts of fertilizers used in the community. Contact fertilizer dealers, county agents, and others.
3. Study the fertilizer use experiences of farmers in the community.

Suggested Demonstration

Proper Placement of Fertilizer in a Greenhouse Demonstration

1. Materials Needed
   - a. Six flower pots of at least one gallon capacity and with a hole in the bottom for drainage.
   - b. Productive soil.
   - c. Fertilizer such as 10-10-10 or some other fertilizer commonly used (one pound).
   - d. Seed of some crop such as corn, grain sorghum, or other common crop.
   - e. Greenhouse, a sunny and warm laboratory, or office.
2. Directions
   - a. For all the pots, for every 10 pounds (4.5kg) of soil used for potting, allow 0.16 ounces (4½gms) of the complete fertilizer. This rate corresponds with a field application of 1 ton per acre (2.2mt/ha).

111

b. In the first two pots, labeled "A" and "B," mix all of the fertilizer with and around the seed.

c. In the next two pots, "C" and "D," place half the fertilizer in each of two spots approximately 2 inches (5cm) to each side of the seed. This corresponds with the "ideal placement" for most crops.

d. In the last two pots, "E" and "F," mix all of the fertilizer with the soil in the bottom of the pot in such a way that all the fertilizer is 6 inches below seed level. This placement corresponds with the placement resulting from plowing-down fertilizer.

e. Plant the seeds.

f. Water all pots slowly, stopping when water starts seeping out of the bottom of the pot.

g. Place all pots in a warm, sunny spot.

h. When there is a big difference in growth among all three series of pots, saturate the soil, invert the pots and tap them on the table, wash out the soil carefully, and observe the root distribution.

3. Interpretation

Normally, the high concentration of fertilizer close to the seed in "A" and "B" will prevent germination or at least injure ("burn") the small seedlings by drawing water from the tender cells. Plasmolysis (exmosis) and death usually result.

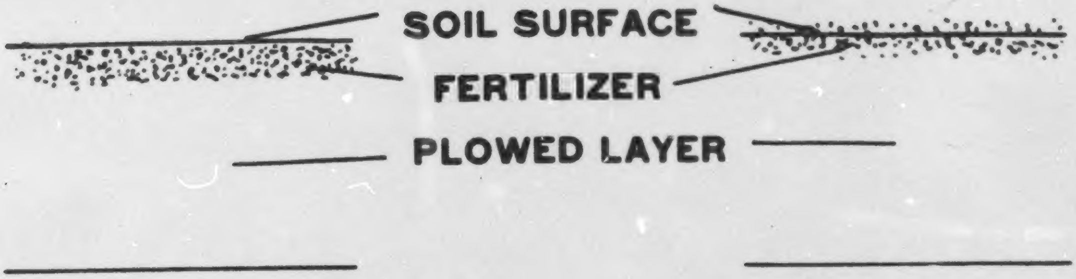
In pots "C" and "D," the growth of the plants should be the best of any series because fertilizer is close to the plant roots and the roots will quickly grow toward the fertilizer and absorb nutrients from it.

Plants in pots "E" and "F" should start growing more slowly than those in pots "C" and "D"; then as the roots reach the fertilizer 6 inches (15cm) away, the plant growth should be faster.

D. Suggested Study Questions

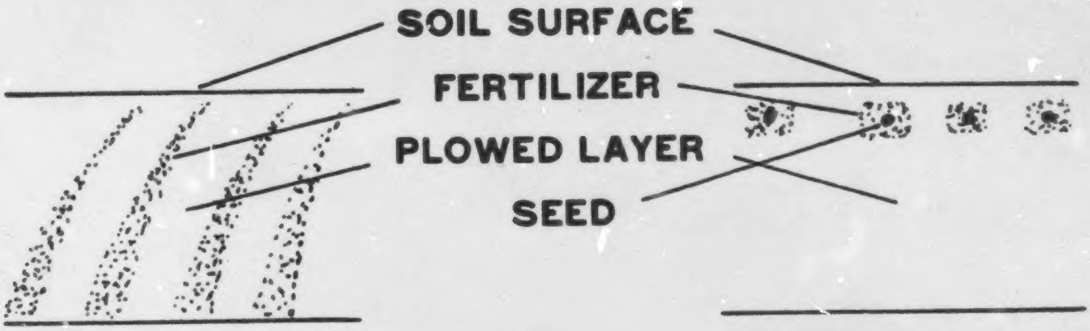
1. Define: fertilizer, deep drilling, top dressing, and side dressing.
2. List the factors that determine the amount of fertilizer to apply.
3. When is the best time to apply fertilizer?
4. List and describe the four methods of fertilizer application.
5. List the ways fertilizer benefits crop production.
6. When should the fertilizer be placed in the soil?
7. Should foliar application be used?

METHODS OF APPLYING FERTILIZER


SOIL SURFACE
FERTILIZER
PLOWED LAYER

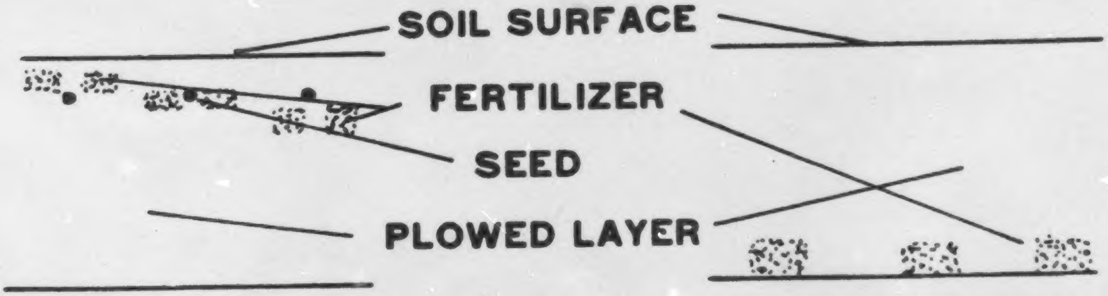
BROADCAST AND DISKED

BROADCAST


SOIL SURFACE
FERTILIZER
PLOWED LAYER
SEED

BROADCAST AND
PLOWED INTO THE SOIL

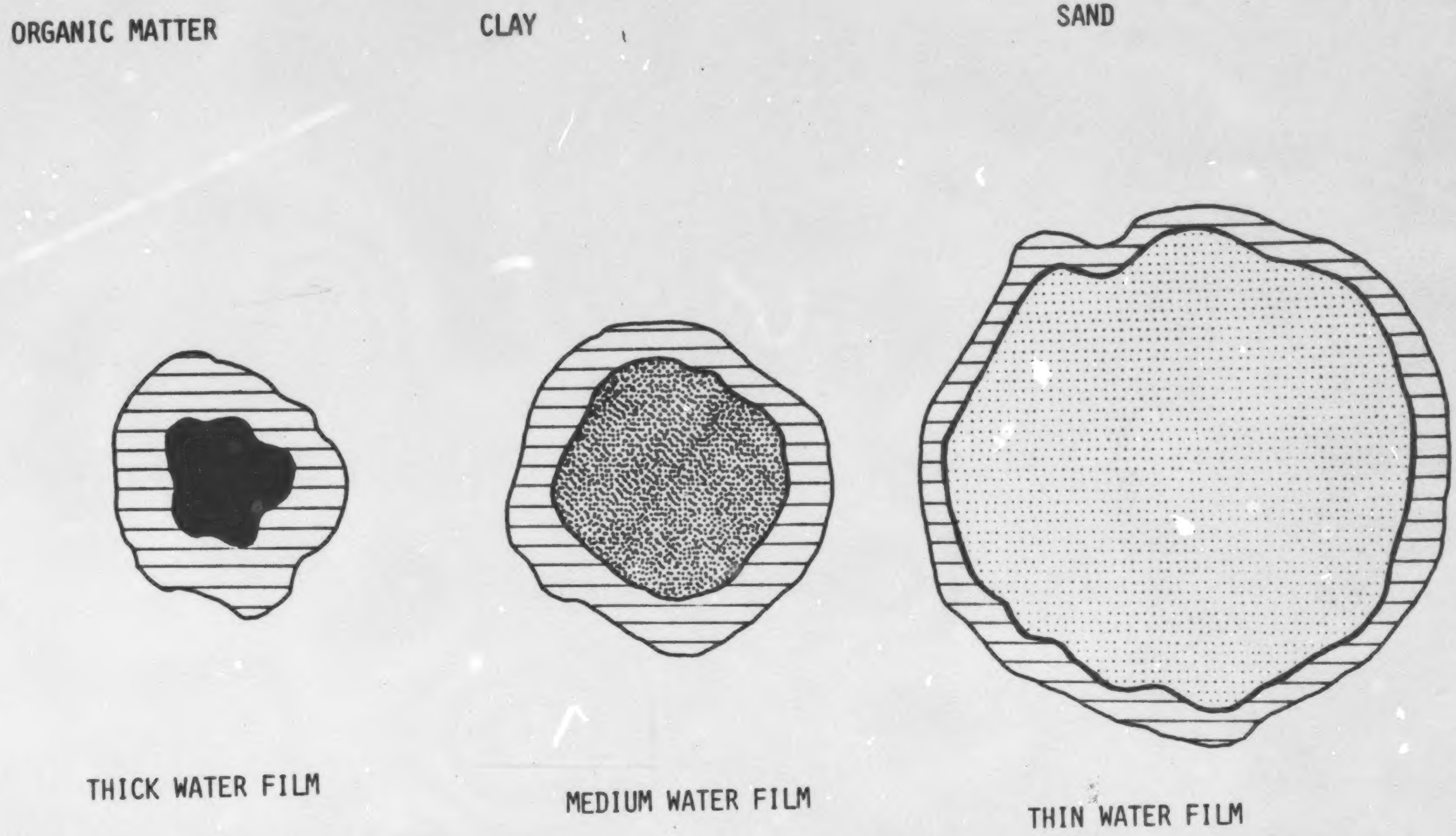
DRILLED IN WITH SEED


SOIL SURFACE
FERTILIZER
SEED
PLOWED LAYER

DRILLED IN ABOVE,
EACH SIDE, AND
BELOW SEED

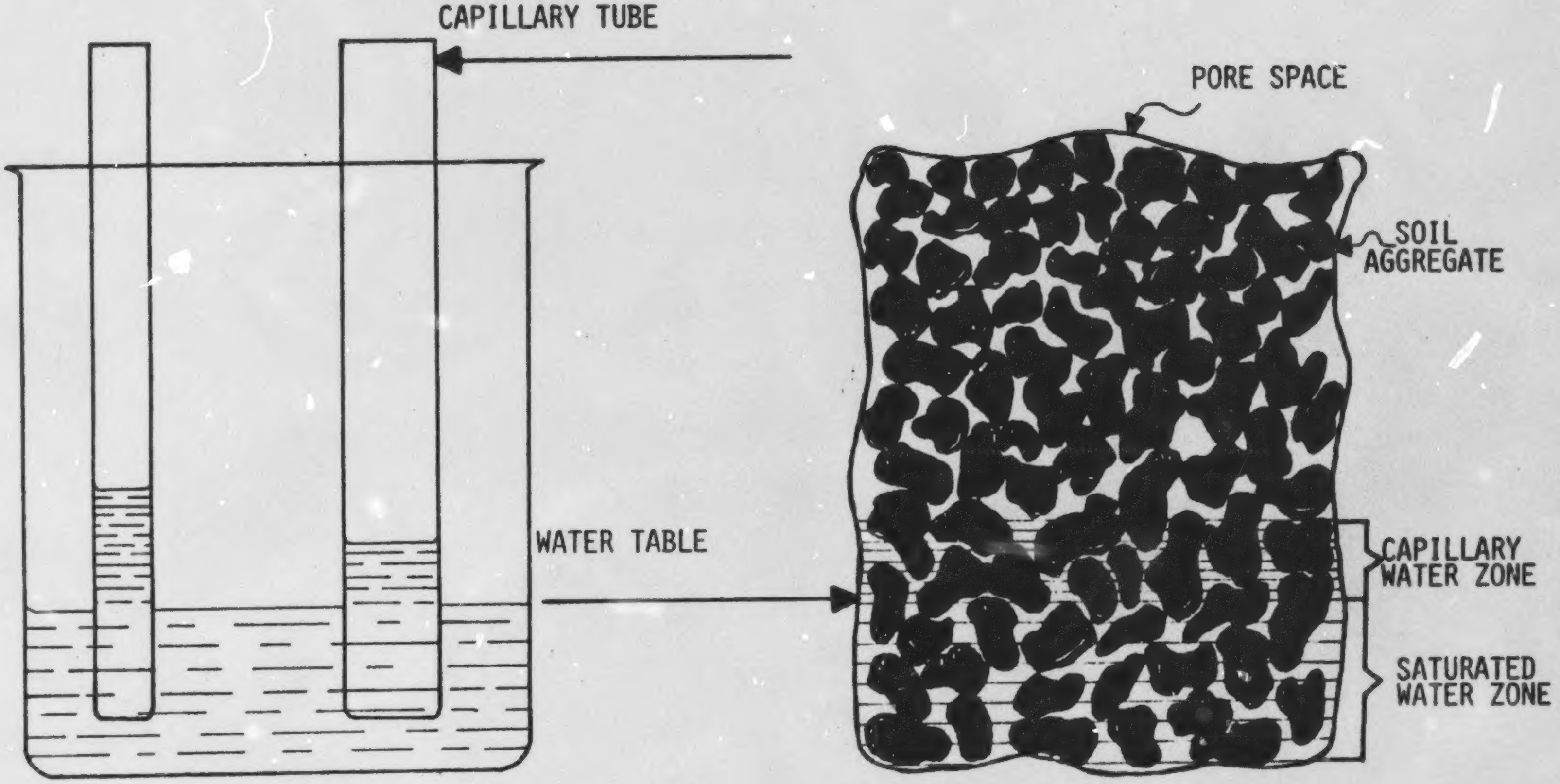
APPLIED AT BOTTOM
OF PLOW

TRANSPARENCY V-3-A


ORGANIC MATTER
CLAY
SAND
THICK WATER FILM
MEDIUM WATER FILM
THIN WATER FILM

THE THICKNESS OF WATER FILM DIFFERS FOR ORGANIC MATTER, CLAY, AND SAND PARTICLES UNDER SIMILAR CONDITIONS

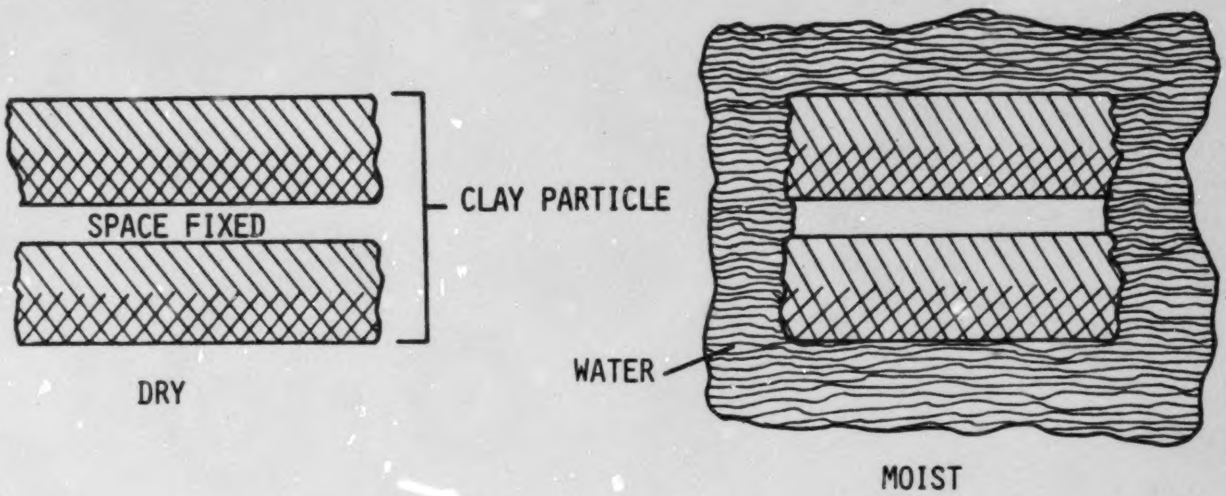
TRANSPARENCY VI-1-A


CAPILLARY TUBE
PORE SPACE
SOIL AGGREGATE
WATER TABLE
CAPILLARY WATER ZONE
SATURATED WATER ZONE

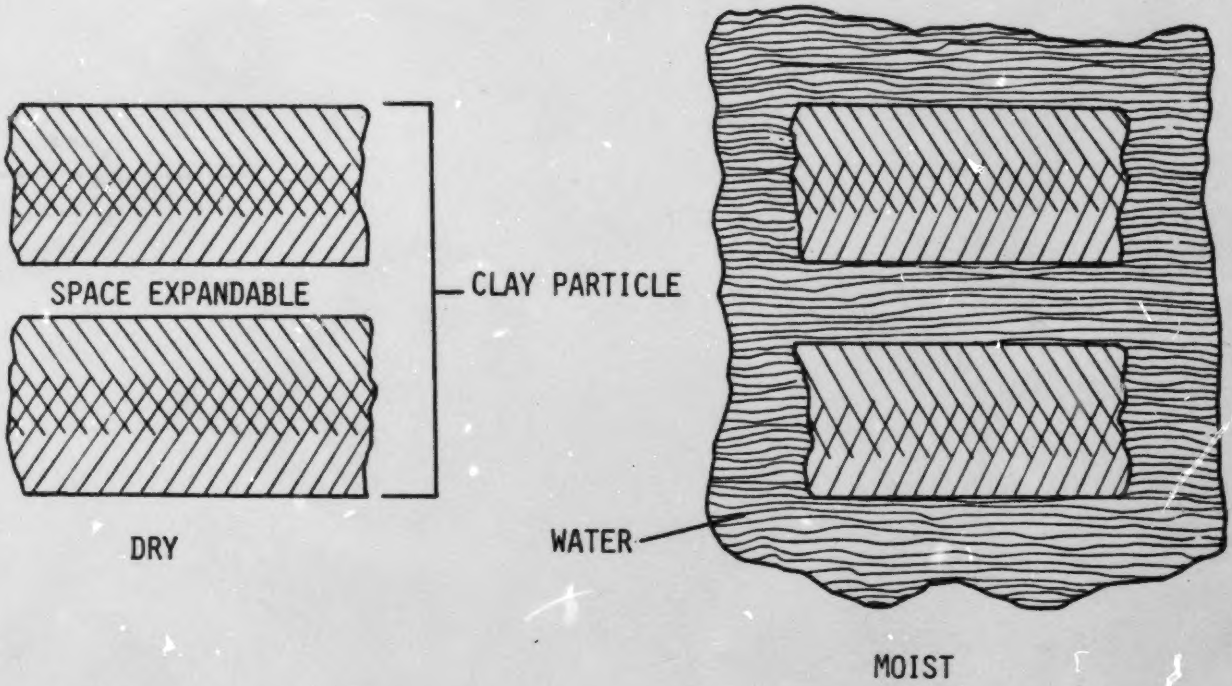
WATER MOVES UPWARD BETWEEN THE WALLS OF SMALL TUBES OR IN NARROW SOIL PORES BECAUSE OF CAPILLARY ATTRACTION

TRANSPARENCY VI-1-B

KAOLINITIC CLAY


SPACE FIXED
CLAY PARTICLE
WATER
DRY
MOIST

MONTMORILLONITIC CLAY


SPACE EXPANDABLE
CLAY PARTICLE
WATER
DRY
MOIST

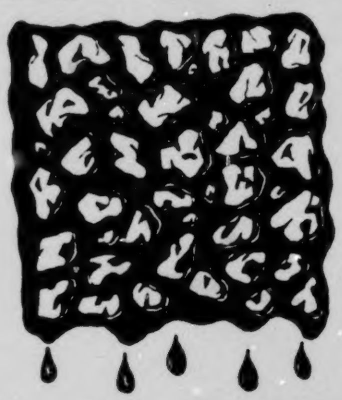
WATER IS HELD BETWEEN, AS WELL AS AROUND, LAYERS OF MONTMORILLONITIC CLAY PARTICLES BUT ONLY AROUND KAOLINITIC PARTICLES

TRANSPARENCY VI-1-C

SOIL MOISTURE CONDITIONS

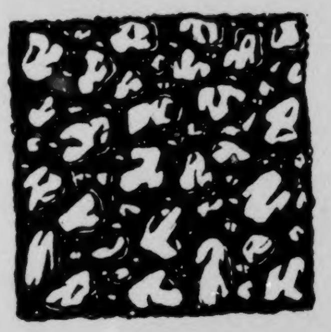
SATURATION

(TOO WET)



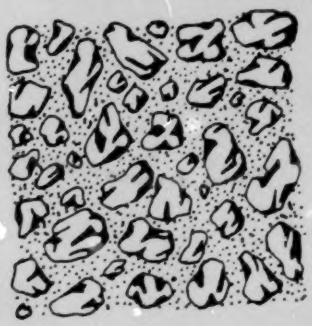
FIELD CAPACITY

(IDEAL)



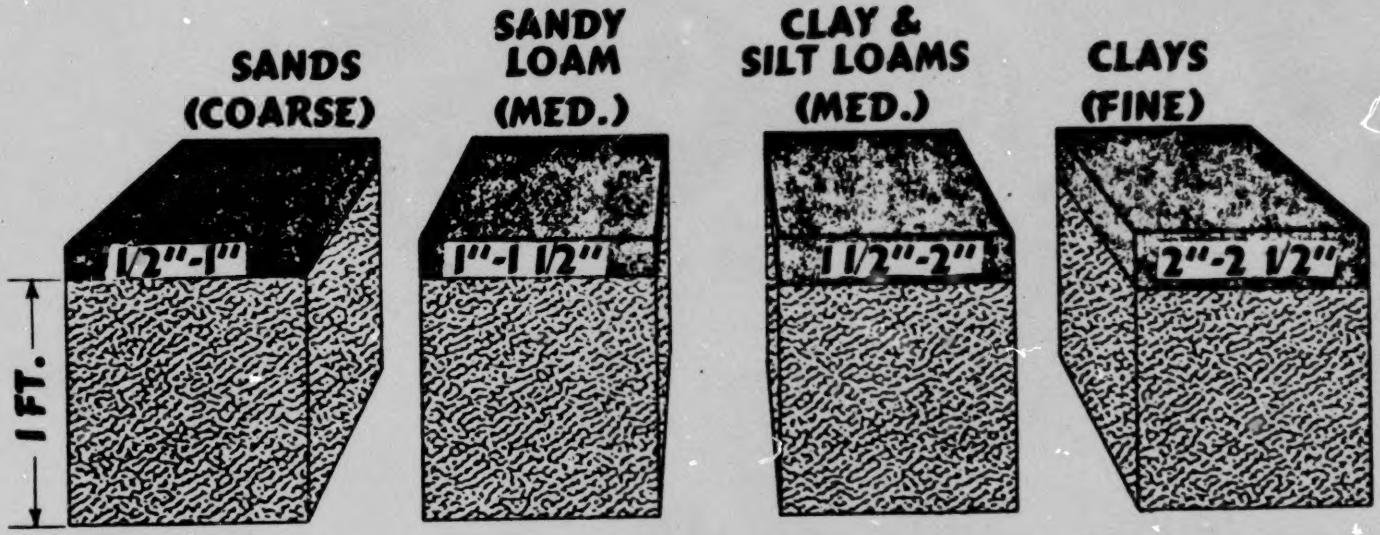
WILTING POINT

(TOO DRY)



TRANSPARENCY VI-1-D

AVAILABLE MOISTURE STORAGE CAPACITY...


SANDS
(COARSE)
SANDY
LOAM
(MED.)
CLAY &
SILT LOAMS
(MED.)
CLAYS
(FINE)
1/2"-1"
1"-1 1/2"
1 1/2"-2"
2"-2 1/2"
1 FT.

(PER FOOT OF DEPTH)

...FOR VARIOUS TEXTURED SOILS

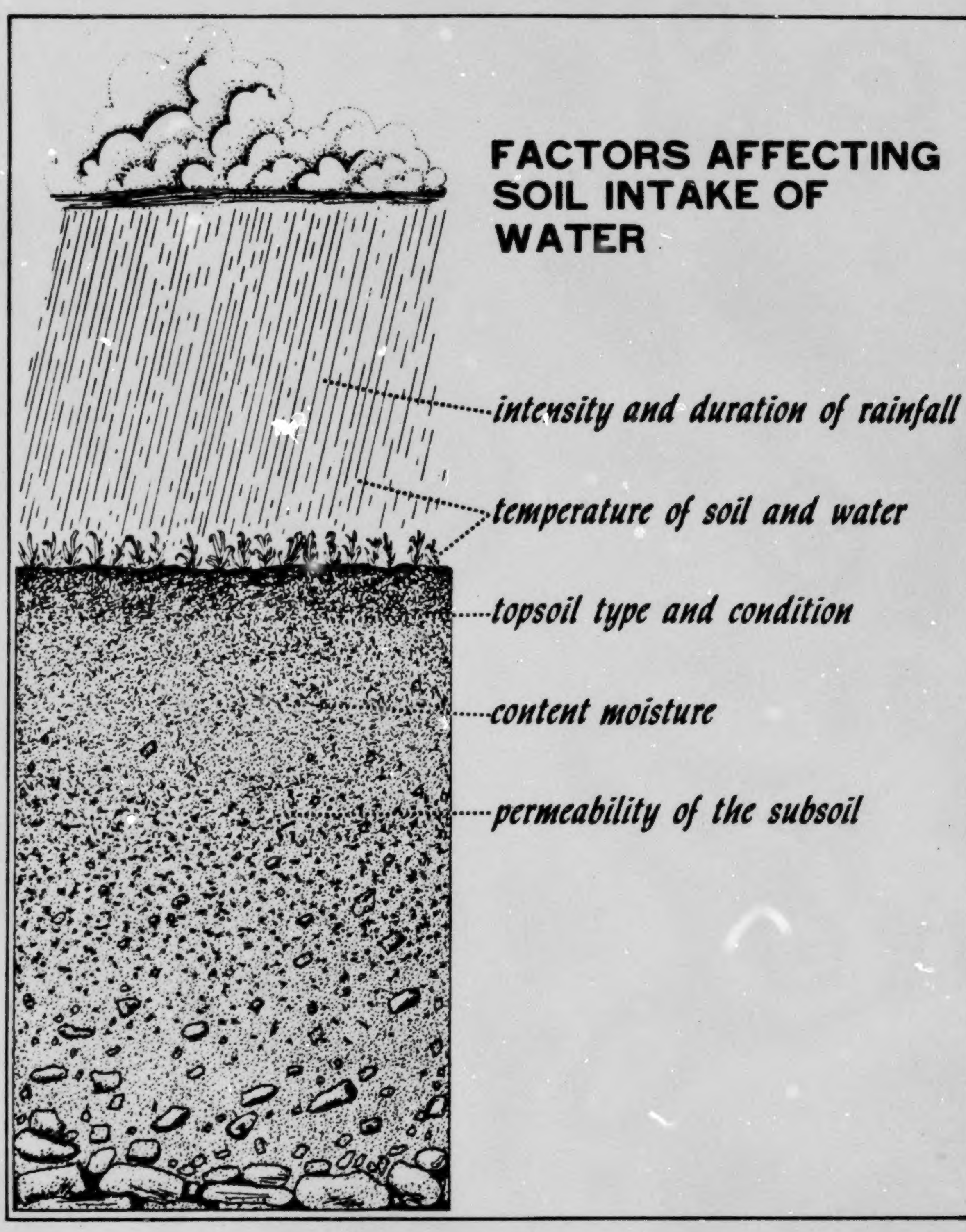
TRANSPARENCY VI-1-E

SUGGESTED PRACTICES FOR CONSERVATION OF SOIL MOISTURE

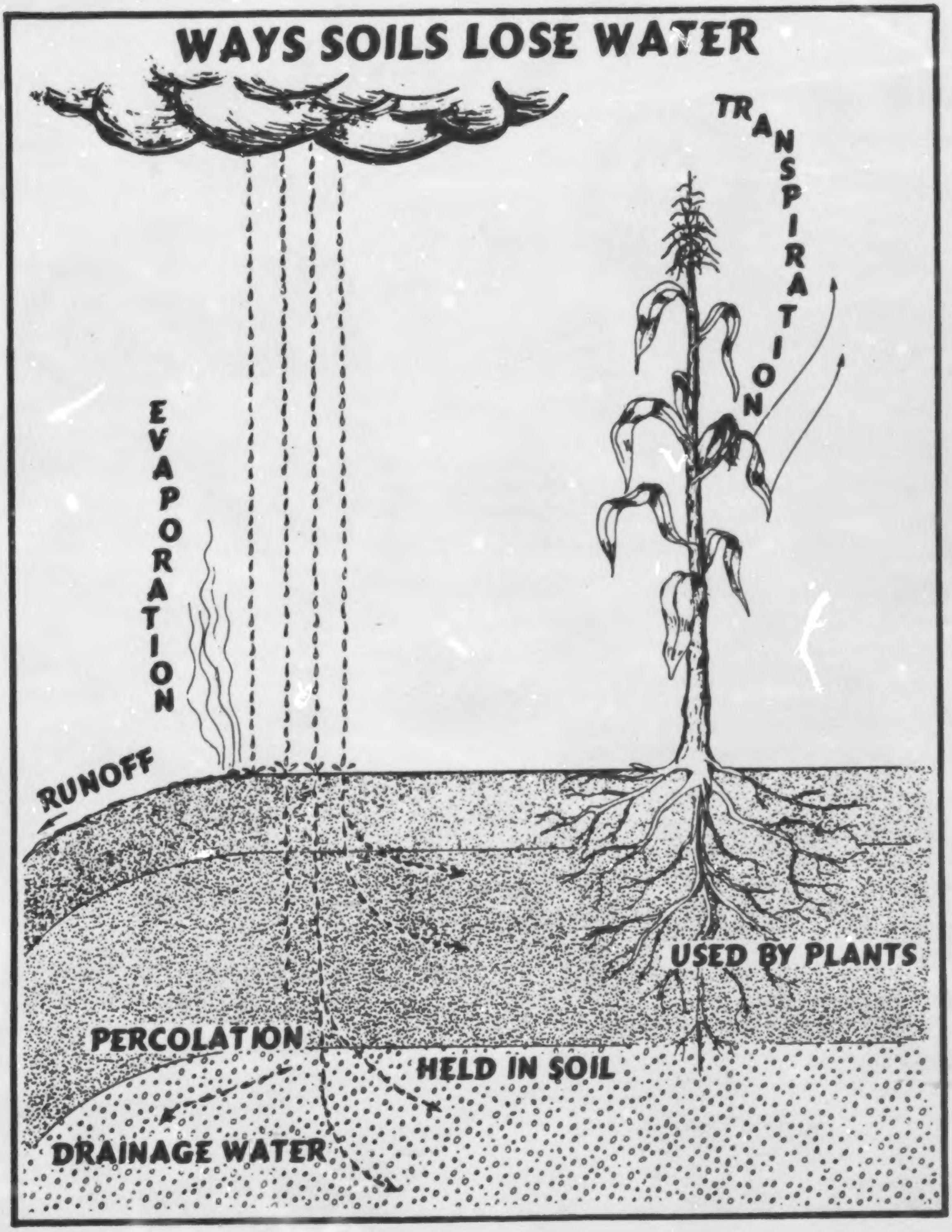
1. REMOVE EXCESS WATER
2. PREPARE SOIL FOR PROPER INFILTRATION
3. CONTROL RUNOFF WATER
4. CONTROL WEEDS
5. FALLOW CROPLAND
6. ROTATE CROPS
7. PROVIDE ADEQUATE FERTILITY
8. USE STORAGE TANKS

TRANSPARENCY VI-1-F

FACTORS AFFECTING SOIL INTAKE OF WATER

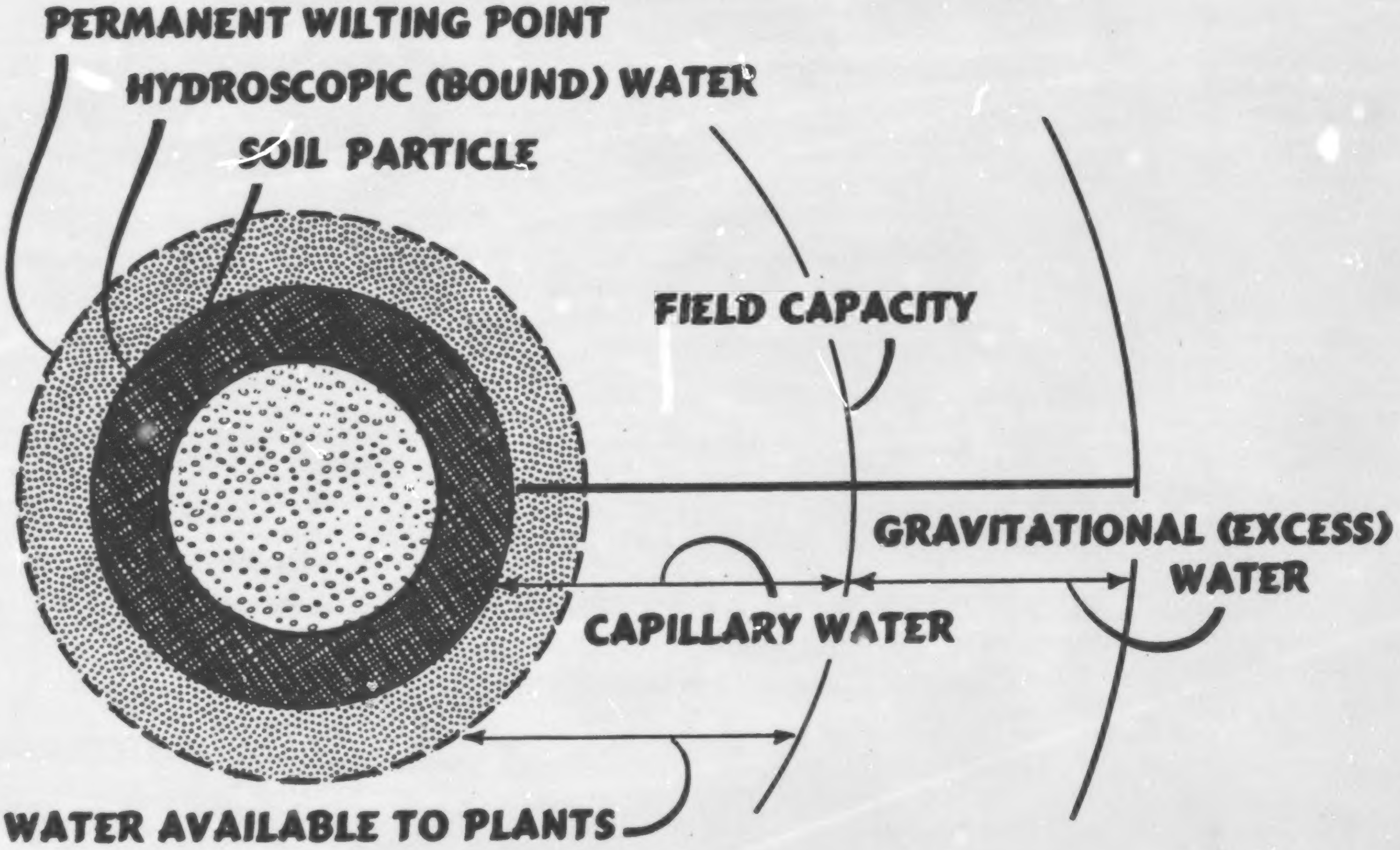

intensity and duration of rainfall
temperature of soil and water
topsoil type and condition
content moisture
permeability of the subsoil

TRANSPARENCY VI-1-G


WAYS SOILS LOSE WATER
TRANSPIRATION
EVAPORATION
RUNOFF
USED BY PLANTS
PERCOLATION
HELD IN SOIL
DRAINAGE WATER

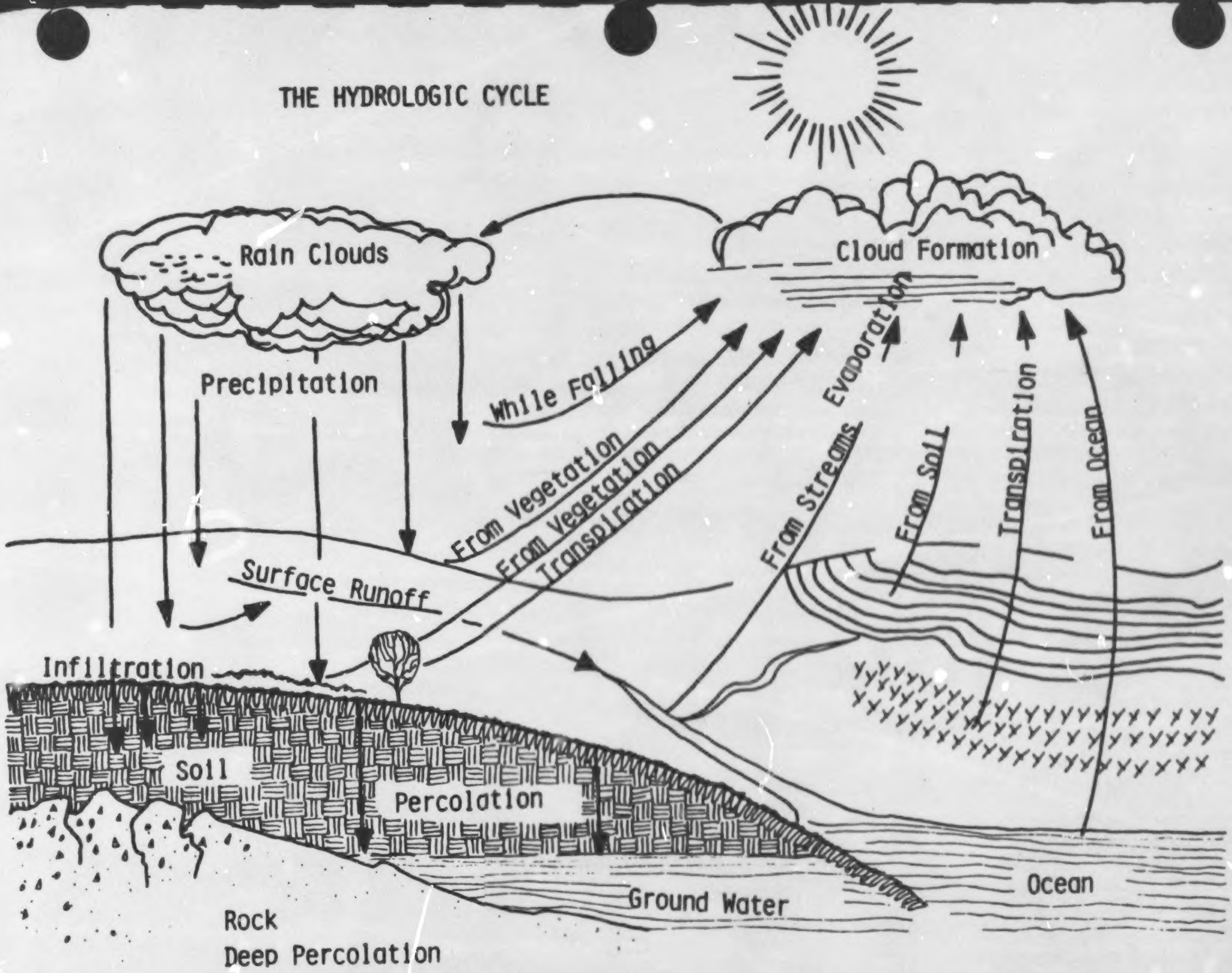
TRANSPARENCY VI-1-H

CLASSIFICATION OF SOIL WATERS


PERMANENT WILTING POINT
HYDROSCOPIC (BOUND) WATER
SOIL PARTICLE
FIELD CAPACITY
GRAVITATIONAL (EXCESS) WATER
CAPILLARY WATER
WATER AVAILABLE TO PLANTS

TRANSPARENCY VI-1-I

THE HYDROLOGIC CYCLE


Rain Clouds
Cloud Formation
Precipitation
While Falling
From Vegetation
From Vegetation
Transpiration
From Streams
Evaporation
From Soil
Transpiration
From Ocean
Surface Runoff
Infiltration
Soil
Percolation
Rock
Deep Percolation
Ground Water
Ocean

WATER MOVES AS A LIQUID OR VAPOR IN A CONTINUOUS CYCLE

TRANSPARENCY VI -1-J

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT VI: Soil Water

LESSON: Classification -- gravitational, capillary, hydroscopic, and water-holding capacity of the soil

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Explain the importance of soil water, how soil properties affect the water-holding capacity of soils, and the relationships between soil water and plant growth.

2. Specific:

a. Demonstrate the water-holding capacities of sandy and clayey soils.
b. Determine soil water availability.
c. List ways available water can be lost by soils.
d. Name the factors important in determining water movement in the soil.
e. Outline the main purpose of water conservation.
f. Describe how strip cropping can contribute to the conservation of soil water.
g. Name and describe two types of mulch.
h. Explain how production techniques influence the efficiency with which water is utilized by plants.
i.
j.
k.

B. Review Teaching Material

1. Donahue, Roy L., Roy J. Follett, and Rodney W. Tulloch. Our Soils and Their Manage-

ment. Danville: Interstate Publishers, 1976.

2. Foth, H.D. and L.M. Turk. Fundamentals of Soil Science. 5th Edition, New York: John Wiley & Sons, Inc., 1972.

3. Kunti, Leo L. & Milton Korpi. Profitable Soil Management. 2nd Edition, Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1970.

C. Special Arrangements

1. Materials

   a. Soil

   b. Chopped grass

   c. Containers

2. Travel

   a. Field tour to farms to examine moisture-holding capacity of soils.

   b. Field tours to farms to observe irrigation layouts, equipment, and practices.

   c. Field tours to farms to observe terracing, strip cropping, and mulching.

II. Presentation of Lesson and Suggested Student Activities

A. Motivation -- Show students plants which have been suffering from drought beforehand to show the importance of water.

B. Content Outline

1. Terms

   a. Gravitational water -- that portion of the soil water that moves downward because of the pull of gravity.

   b. Capillary water -- that portion of soil water that is held in pores as a result of attractive forces between the water and soil particles and is unavailable to plants.

   c. Hygroscopic water -- found in thin films around soil particles and is unavailable to plants.

   d. Water-holding capacity -- is a soil property which represents the amount of water a soil can retain after it has been saturated by rain and downward movement has ceased.

   e. Available soil water -- that amount present in a soil which can be removed by plants. It is designated as the difference between the field capacity and the wilting point.

   f. Wilting point -- the moisture content of a soil in which growing plants wilt and will not recover after water is added.

   g. Infiltration rate -- the time required for a given amount of water to pass through a soil.

   h. Evaporation -- the process whereby liquid water changes into a gas or vapor.

   i. Transpiration -- the process by which water, as a vapor, is lost by living plants.

2. Water Entry Factors

   a. Slope

   b. Cover and condition

c. Texture

d. Amount of rainfall

3. Forms in which water can be found in the soil are:

   a. Gravitational -- This is the water that moves in the soil because of the downward pull of gravity. If the soil is poorly drained, gravitational water may accumulate in pores resulting in waterlogged condition. This is generally unfavorable for plant growth.

   b. Capillary -- This includes water that moves or is held under capillary forces. The size of the soil pores will influence the amount of soil water held by capillary forces.

   c. Hygroscopic -- Very thin films around soil particles represent hygroscopic water. These water films are drawn to the particles by very strong forces that cause the water molecules to be arranged in a semi-solid form. Most of the hygroscopic water is unavailable to plants.

4. Water-Holding Capacities of Soils -- The most important factors affecting the water holding capacities of soil are: (Transparencies VI-1-A&D)

   a. Soil Texture (Transparency VI-1-C&E)

      1) The smaller the soil particles the greater the soil's water holding capacity.

      2) Because of the smaller size of clay particles, fine textured soils have more total pore space than those with coarse textures. This means that fine textured soils also have more total surface area and can hold films of hygroscopic water.

   b. Soil Structure (Transparency VI-1-B)

      1) Soils that have a granular structure will allow water to move into

them readily and will also have a high water holding capacity.

2) Compacting soil with heavy machinery destroys structure which will generally reduce the water holding capacity of a soil.

c. Organic Matter

1) Organic matter has the capacity to absorb and hold quantities of water equivalent to several times its weight.

2) Organic matter aids in cementing particles of clay, silt, and sand together into clumps, which increases the water holding capacity.

3) This is especially important in clay soils and can result in a considerable increase in the amount of water available to plants.

5. Water Losses from Soils (Transparencies VI-1-F,H,I,&J)

a. Gravitational losses -- This water moves in a downward direction. Through large soil pores, usually between granules or clumps of particles. This downward movement is important since soluble materials such as fertilizers dissolve in water and move to depths below the plant root zone.

b. Evaporation losses -- Temperature is an important factor affecting the rate of water evaporation from the surface of a soil. As the temperature increases, water will evaporate more rapidly because of the greater movement of water molecules and the fact that warm air will hold more water than cool air.

The temperature of a soil is generally lower under vegetative cover, mulches, and other treatments that provide shade.

Wind velocity and humidity are other factors which influence evaporation rates.

6. Removal by Plants

   a. Growing plants remove water from a soil.

   b. The greatest proportion of water absorbed by plants is lost through transpiration.

   c. Transpiration is the term used to describe the loss of water vapor from plants.

7. Conservation of Soil Water (Transparencies VI-1-G)

   a. Terraces and Strip Cropping

      1) The construction of terraces has been used with varying degrees of success as a means of preventing runoff and increasing the movement of water into the soil.

      2) A terrace is a broad bank of soil with gentle sloping sides.

      3) Terraces aid in the conservation of soil water by allowing the slowing down of surface run-off.

      4) Terracing may be combined with strip cropping on steep slopes to prevent the rapid runoff of water.

      5) Strip cropping refers to a system of alternate strips of sod and row crops running parallel with the contour.

   b. Cropping Practices

      1) Adequate fertilization will aid in more efficient use of soil water.

      2) Subsoiling can be used to increase the volume of soil from which roots can absorb water.

      3) Surface mulches aid in conserving soil water.

4) Mulching reduces soil temperature, therefore, it causes a reduction of evaporation losses.

5) Mulches are of two general types, natural and artificial.

6) In order to increase plant production organic matter should be maintained at a high level.

7) Plant canopy will help conserve soil and water.

C. Suggested Student Activities

1. Select a soil site in the community and discuss how soil erosion and loss of soil fertility have taken place.

2. Field trips to farms utilizing terraces, strip cropping, and mulching.

3. Arrange field trips to study and observe irrigation layouts, equipment, and practices.

4. Take field trips to examine the moisture-holding capacity of soils of different textures. Press the soil into balls to observe water holding properties.

5. Conduct laboratory demonstrations on the effect of mulches on the evaporation of water. Fill three containers of equal size with silt loam within 1½ inches of the top. Add enough water to each container to bring the soil moisture up to field capacity. Add one inch of chopped grass to one container and one inch of silt loam to a second container. Keep the third container as a check. Weigh each of the containers each day and record the loss in weight due to evaporation.

D. Suggested Study Questions

1. Name the factors that affect water entry.

2. Name the three classes of soil water. Define each of the classes.

3. Name and discuss the four factors influencing water-holding capacity.

4. What factors influence the rate of evaporation?

5. Define transpiration. How does it affect soil water?

6. What methods may be used to conserve soil water?

7. List different kinds of artificial and natural mulches.

8. List ways water can be lost by soils.

9. Name some ways water may be conserved.

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT VII: Soil Judging

LESSON: Conducting Soil Judging Contest

I. Preparation for Instruction

A. Student Objectives

1. Terminal: Judge soils and follow the procedures in the soil judging contest.

2. Specific:

a. Define soil.
b. Describe how soils are developed.
c. Identify soil layers.
d. List how soils are classified and named.
e. List and explain the factors to consider in developing soil conservation plans.
f. Complete the Louisiana FFA soil judging scorecard.

B. Teaching Materials

1. Soil Judging for La. Future Farmers of America. Louisiana Dept. of Ed., Bulletin 1550, Baton Rouge, 1978.

2. Land Evaluation Guide for Vocational Agriculture. Louisiana Dept. of Ed., Baton Rouge, 1957.

3. "Land Capability Classifications," Agriculture Handbook No. 210, Soil Conservation Service, U.S. Dept. of Agriculture, Washington D.C.

Films and Filmstrips

1. Know Your Land -- Fifty 2x2 slides, NASCO 01920P-C128.

2. Our Living Soil -- Thirty-one 2x2 slides, NASCO 04009P-215.

C. Special Arrangements

1. See Soil Judging for Louisiana Future Farmers Bulletin No. 1505)

2. Materials Needed:

    a. Hand level

    b. Spade and shovel

    c. Slope and area stakes

    d. Chain

II. Presentation of Lesson and Suggested Student Activities

A. Motivation for Lesson: Soils are a primary source of food, clothing and shelter. People depend on soils for most of their food except that which comes from rivers, lakes, and oceans. Clothing comes largely from cotton and wool, which are dependent on the soil. Most homes in America are built with wood, a product of the soil.

B. Content Outline

1. What is Soil?

   a. Soil is the loose surface material of the earth in which plants grow.

   b. Soil is made up of four main parts (Transparency VII-1-A)

      1) Mineral matter

      2) Organic matter

      3) Air

      4) Water

   c. In addition, the soil is full of living organisms. These living things are bacteria, fungi, algae, insects, and smaller animals.

2. How Soils Develop

   a. Each soil is a product of five factors.

      1) Parent material

      2) Climate

      3) Living organisms

      4) Topography

      5) Time

   b. The kind of soil at any one place is the result of the five factors working in combination at that place.

3. Soil Profile (Transparency VII-1-B)

   a. Most soils have three main horizons:

      1) A Horizon -- surface layer

      2) B Horizon -- subsoil

      3) C Horizon -- parent material

   b. Soils do not always have three distinct horizons because:

1) The top soil (A Horizon) may have been removed by erosion.

2) Very young soils of the flood plains may have not yet developed a B Horizon.

4. Classifying and Naming Soils

   a. Soil profiles are identified and classified according to the horizon present and their characteristics.

   b. A soil type briefly describes one particular soil.

5. Soil and Water Conservation

   a. Conservation and wise use of the soil and moisture on crop lands, grasslands, and woodlands is the key to keeping the land productive, people healthy, and the nation strong. (Transparency VII-1-C)

   b. The Farm Conservation Plan includes drainage and erosion control practices, land use, cropping systems, soil fertility treatments, and management for range, woodland, and wildlife.

6. Soil Judging Scorecard for Louisiana FFA (Transparency VII-1-D)

   a. Part I -- Soil Class Factors

      1) Surface texture -- the proportion of sand, silt, and clay that make up the soil mass.

      2) Permeability -- the movement of air and water in the soil.

      3) Depth of Soil -- thickness of soil layer.

      4) Slope -- the number of feet of fall per 100 feet. (Transparency VII-1-E)

      5) Erosion -- the loss of soil by water and wind.

      6) Surface Run-off -- the relative rate water is removed by flow over

the surface of the soil.

7) Other Major Factors
    a) Wetness
    b) Flooding
8) Land Capability Classes -- Class I-VIII

b. Recommended Soil Treatments
    1) Vegetative
    2) Mechanical
    3) Fertilizer and soil amendments

C. Suggested Student Activities

1. Collect soil samples and determine texture.
2. Visit site to show profile.
3. Estimate percent of slope.
4. Observe eroded areas.
5. Classify according to capability classes.
6. Analyze and determine soil amendments from information listed on assumption sheet.
7. Participate in class soil judging contest.

D. Suggested Study Questions

1. Terms define:
    a. Soil
    b. Mineral matter
    c. Organic matter
    d. Parent material
    e. Topography
    f. Weathering
    g. Soil horizon

- h. Topsoil
- i. Subsoil
- j. Soil profile
- k. Soil conservation
- l. Soil survey
- m. Drainage
- n. Erosion
- o. Permeability
- p. Slope
- q. Soil amendment

2. Study Questions

- a. Why are soils so important to the welfare of man?
- b. List the four main parts of the soil.
- c. List five or more living organisms found in the soil.
- d. List and explain five factors that affect soil development.
- e. What are the four major parent materials from which Louisiana soils are formed? Briefly explain each.
- f. Explain why climate has very little influence on the development of soils in Louisiana.
- g. Draw and label a soil profile.
- h. Is it possible for soils to have fewer than three horizons? If so, explain why.
- i. Why is the A horizon usually darker in color than the other layers?
- j. How are soils classified and named?
- k. How many different soil profiles have been identified in Louisiana?

l. How may a soil map benefit a land owner?

m. What is the key to keeping the land productive, people healthy, and the nation strong?

n. What is included in a soil conservation plan?

o. List and explain the eight soil class factors.

p. Name the eight soil classes and the limitations of each class.

q. How deep is the topsoil in your community?

r. Name the three recommended soil treatments for Louisiana.

s. Why is it necessary to lime our soil so often in Louisiana?

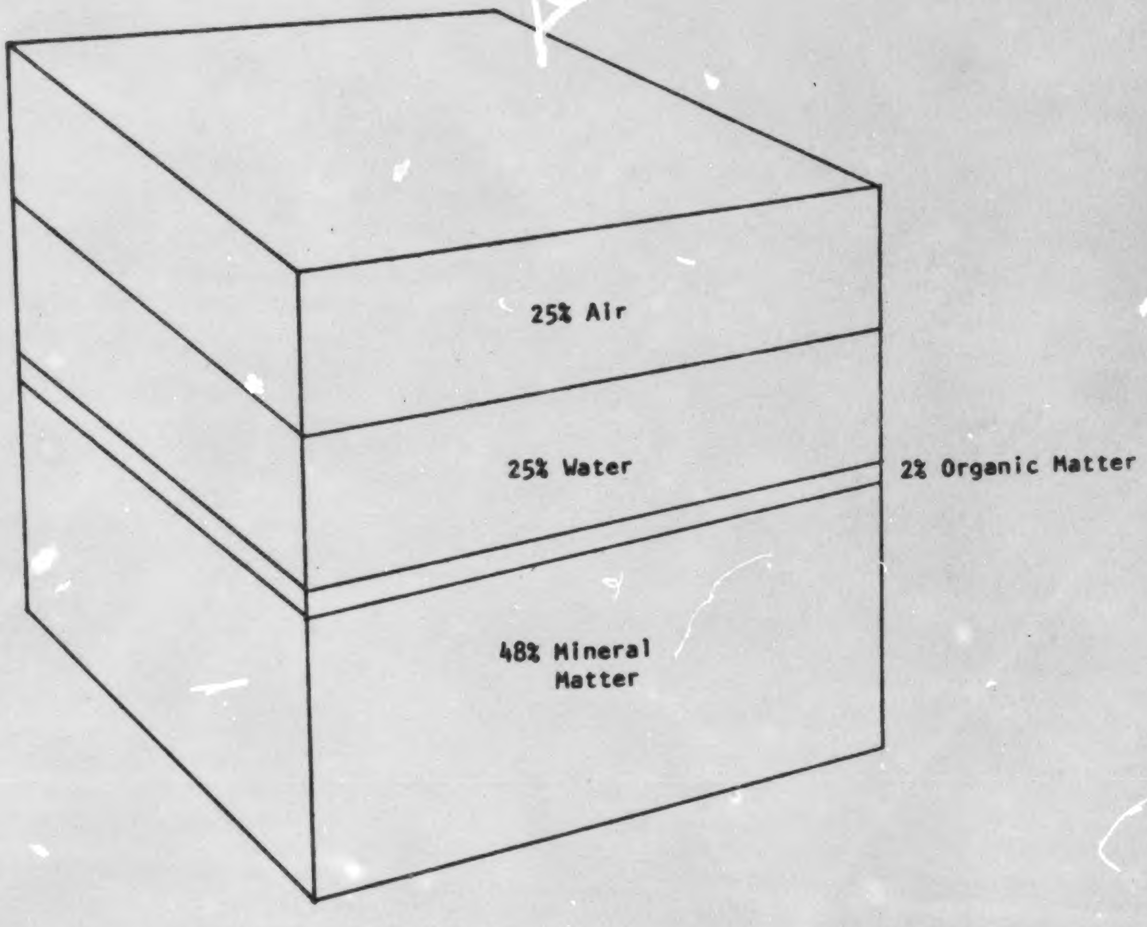

25% Air
25% Water
2% Organic Matter
48% Mineral Matter

FIGURE 2--Volume Composition of a Typical Silt Loam Soil

TRANSPARENCY VII-1-A

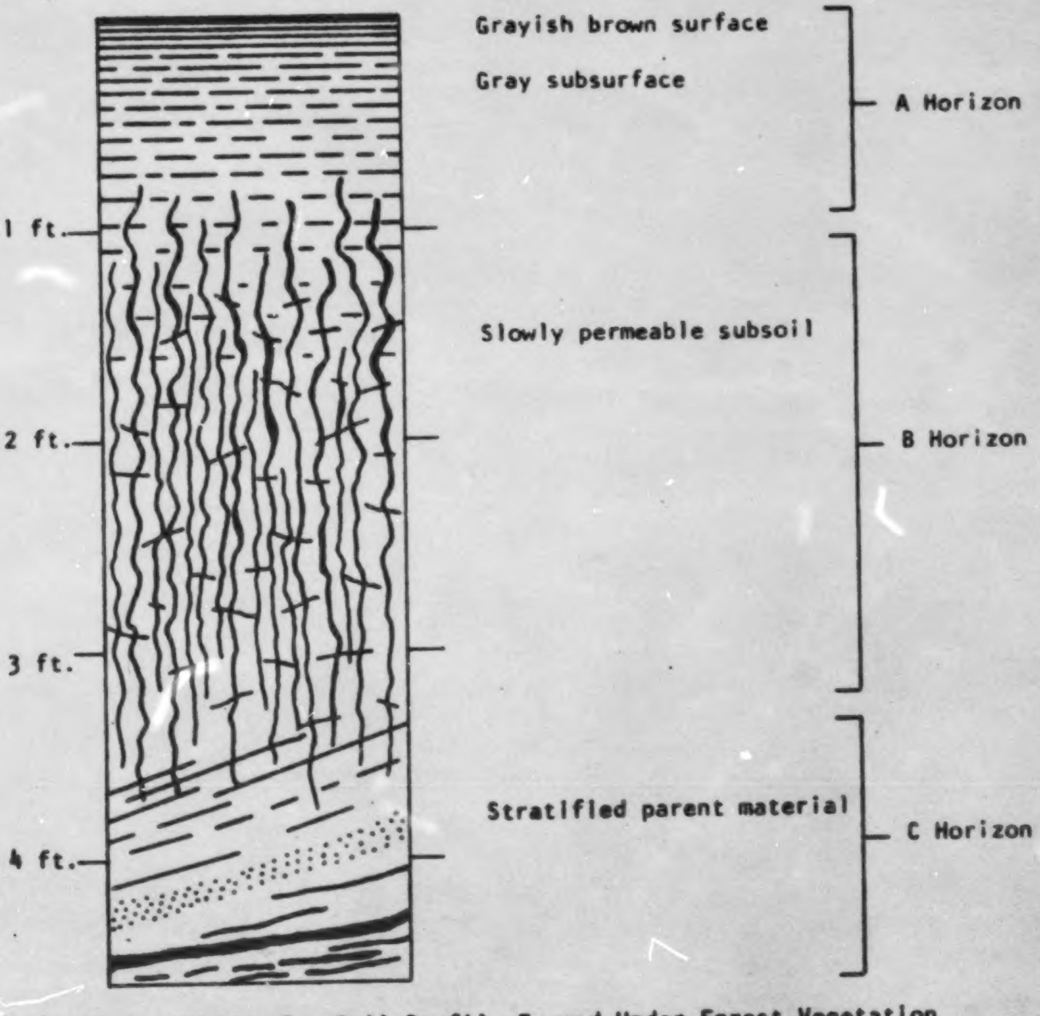

Grayish brown surface
Gray subsurface
A Horizon
1 ft.
Slowly permeable subsoil
2 ft.
B Horizon
3 ft.
Stratified parent material
4 ft.
C Horizon

FIGURE 3--Sketch of a Soil Profile Formed Under Forest Vegetation

TRANSPARENCY VII-1-B

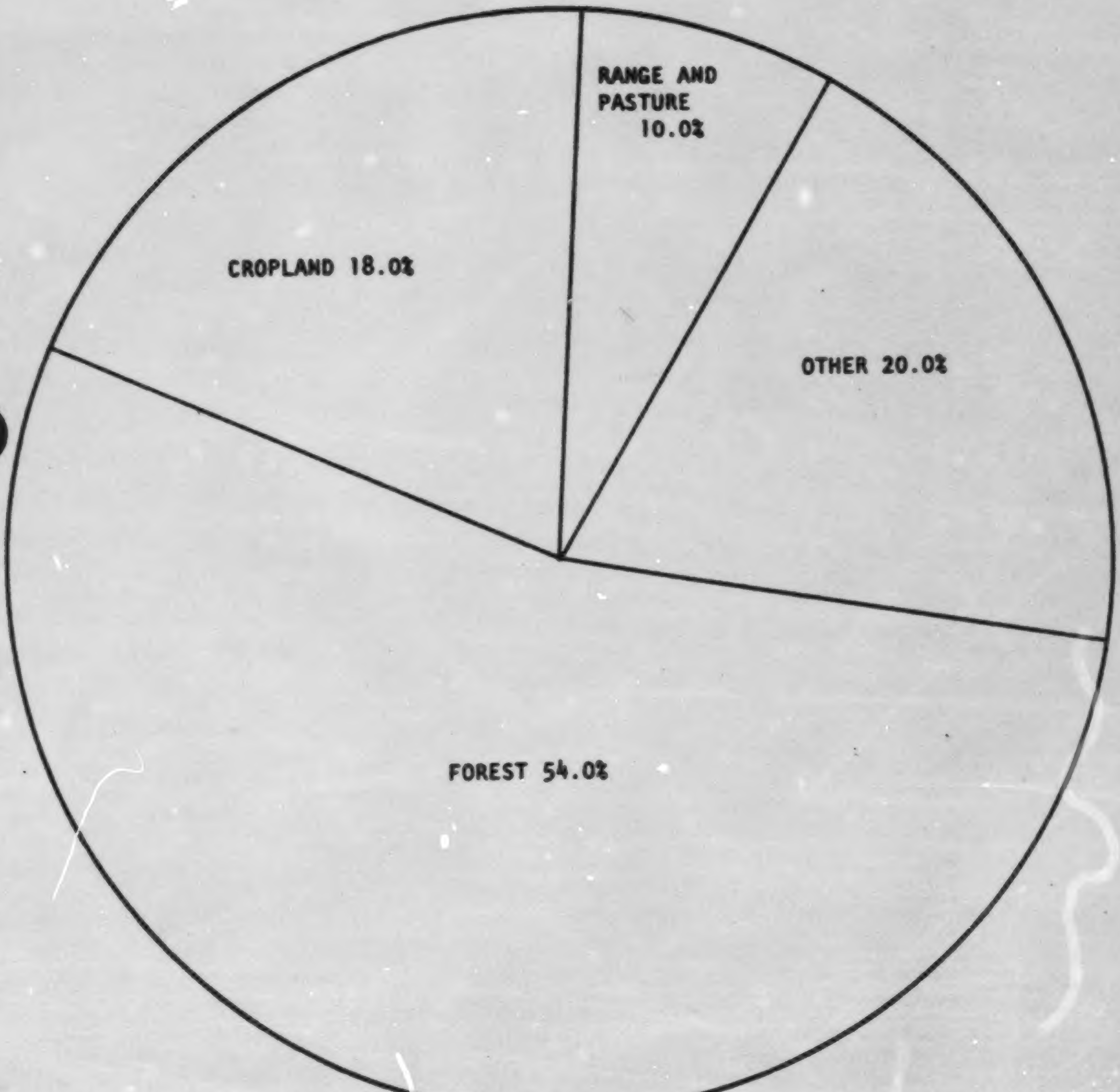


FIGURE 1--The Percentage of Louisiana Land Used For Forest, Cropland, Pasture and Range, and Other Uses (Roads, Cities, Water, Federal Land, etc.)

TRANSPARENCY VII-1-C

FFA SOIL JUDGING SCORE CARD NL-1

Contestant No.____________ ____ Field No.______________

Name ____

Address ______________________________________

Parish/School __________________________________

Part 1—Soil Class Factors

Indicate by an X in the square with number

Score

A. SURFACE TEXTURE
☐ 1. Sandy soils
☐ 2. Loamy soils
☐ 3. Clayey soils

B. PERMEABILITY
☐ 1. Rapid
☐ 2. Moderate
☐ 3. Slow
☐ 4. Very slow

C. DEPTH OF SOIL
☐ 1. Deep
☐ 2. Moderately deep
☐ 3. Shallow
☐ 4. Very shallow

D. SLOPE
☐ 1. Nearly level
☐ 2. Gently sloping
☐ 3. Moderately sloping
☐ 4. Strongly sloping
☐ 5. Steep
☐ 6. Very steep

E. EROSION—WIND & WATER
☐ 1. None to slight
☐ 2. Moderate
☐ 3. Severe
☐ 4. Very severe

F. SURFACE RUNOFF
☐ 1. Rapid
☐ 2. Moderate
☐ 3. Slow
☐ 4. Very slow

G. MAJOR FACTORS that keep area out of Class I
☐ 1. Texture ☐ 5. Erosion
☐ 2. Perm. ☐ 6. Runoff
☐ 3. Depth ☐ 7. Wetness
☐ 4. Slope ☐ 8. Flooding
☐ 9. None

H. LAND CAPABILITY CLASS
☐ 1. Class I ☐ 5. Class V
☐ 2. Class II ☐ 6. Class VI
☐ 3. Class III ☐ 7. Class VII
☐ 4. Class IV ☐ 8. Class VIII

Part 2
Recommended Soil Treatments

Needed for different land capability classes

Score

VEGETATIVE

Use soil conserving and/or soil improving crops:
☐ 1. Every 4th or 5th year
☐ 2. Every 3rd or 4th year
☐ 3. Every 2nd year
☐ 4. Every year
☐ 5. Do not burn crop residue
☐ 6. Residue management and/or minimum tillage
☐ 7. Establish recommended grass or grasses and legumes
☐ 8. Proper pasture and range management
☐ 9. Protect from burning
☐ 10. Control grazing
☐ 11. Plant recommended trees
☐ 12. Harvest trees selectively
☐ 13. Use only for wildlife or recreation area

MECHANICAL
☐ 14. Control brush or trees
☐ 15. Terrace and farm on contour
☐ 16. Maintain terraces
☐ 17. Construct diversion terraces
☐ 18. Install drainage system
☐ 19. Control gullies
☐ 20. No mechanical treatment needed

FERTILIZER AND SOIL AMENDMENTS
☐ 21. Lime
☐ 22. Phosphate (P)
☐ 23. Potash (K)
☐ 24. Nitrogen (N)
☐ 25. Fertilizer or soil amendments not needed.

SCORE PART 1 (Possible 40)____________ SCORE PART 2 (Possible 30)____________ TOTAL SCORE (Possible 70)____________

TRANSPARENCY VII-1-D

CONDITION OF FIELD

FIELD NO.

1. Soil tests show:
   a. pH
   b. Phosphorus lbs./acre P_2O_5
   c. Potassium lbs./acre K_2O
   d. Nitrogen lbs./acre N
   e. Other

2. Pay no attention to present mechanical practices.
3. Thickness of original topsoil was .
4. Size of field acres.
5. Treat for most intensive use.
6. Other factors:

SIZE OF FIELD

The fields to be judged should be a minimum of 100 feet by 100 feet in size. Flags or stakes must be set to indicate the boundary of the area to be considered. A different colored flag or stake should be used for slope. (See Fig. 1).

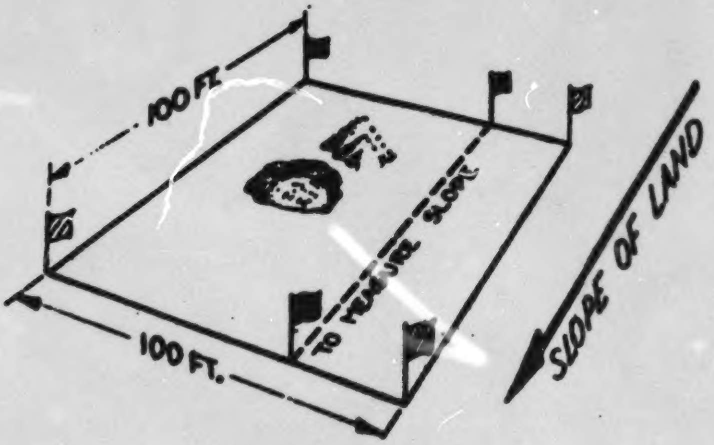


Fig. 1—Select a group of four fields for judging. Within each field select a uniform sample area not less than 100 x 100 feet which will represent the field. Sample areas do not have to be square. Set slope stakes.

OBSERVING THE SOIL

The contestants or students must be able to see the soil in order to determine important characteristics. Roadside cuts and ditches may be used where suitable for training purposes. For a contest, however, a site away from a road or ditch is preferable. This can be provided as shown in Fig. 2.

TRANSPARENCY VII-1-E

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT I: Soil Formation

LESSON 1: Definition of Soil

PART I: TRUE - FALSE Read each of the following statements. If the statement is true, circle the "T"; if it is false, circle the "F".

T F 1. Soil is a mixture of rock particles, organic material, plants, animals, air and water.

T F 2. A soil profile is a horizontal view which shows the various soil layers.

T F 3. The B Horizon of the soil is also known as topsoil.

T F 4. Most of the organic matter in a soil is found in the B Horizon.

T F 5. The soils that man depends upon most are neither highly fertile nor very unproductive.

T F 6. Generally, the more organic matter a soil contains the more productive it will be.

T F 7. There are eight general soil areas in Louisiana.

T F 8. Parent material is always composed of bedrock.

T F 9. Soils are continually developing and changing.

T F 10. Most alluvium soils in Louisiana have been deposited by the Red River.

PART II: MATCHING - Match the statements from Column B with the terms that best fit in Column A. Place your answer in the blank provided.

COLUMN A

_____ A. Subsoil

_____ B. Soil

_____ C. Soil Profile

_____ D. Topsoil

_____ E. Coastal Marsh

_____ F. Organic Matter

_____ G. Parent Material

_____ H. A - Horizon

_____ I. B - Horizon

_____ J. Coastal Prairies

1. Part of the soil profile directly under the surface soil.
2. Uppermost layer of the soil profile which is cultivated.
3. The mineral and organic matter that supports plant growth on the earth's surface.
4. Used mostly for rice, pastures and hay.
5. Third layer of soil profile.
6. A cross-section which shows the soil layers one below the other.
7. Second layer of the soil profile.
8. Top layer of the soil profile.
9. Used mostly for hunting, fishing, trapping and recreation.
10. Remains of plants and animals.
11. Used mainly for pine forest although some strawberries are grown in the southeastern area.
12. Found mainly in northeastern, south central and southeastern parts of the state.

PART III: MULTIPLE CHOICE Select the best answer to each of the statements below and place the letter in the blank provided.

_____ 1. The uppermost layer of the soil profile is referred to as:

a. Subsoil
b. Topsoil
c. Organic matter
d. Parent material

_____ 2. This layer of the soil profile supports most plant and animal life on earth.

a. C-Horizon
b. A-Horizon
c. B-Horizon
d. Parent material

_____ 3. Which of the following has the least effect on the productive capacity of a soil?

a. Organic material
b. Plants and animals
c. Air and water
d. Crop being grown

_____ 4. Which of the following is not one of the six general soil areas of Louisiana?

a. Mississippi terraces
b. Coastal prairies
c. Recent alluvium
d. Dunkirk loam

_____ 5. The zone of natural accumulation is the:

a. C-Horizon
b. B-Horizon
c. A-Horizon
d. Organic matter

_____ 6. The soil area of Louisiana producing mostly pine timber and cattle grazing is the:

a. Coastal plain
b. Recent alluvium
c. Coastal prairies
d. Flatwoods

131 ____ 7. The soil area of Louisiana used mainly for rice, pasture and hay is the:

a. Coastal marsh
b. Coastal prairies
c. Recent alluvium
d. Dunkirk loam

____ 8. The parent material is found in the:

a. B-Horizon
b. C-Horizon
c. A-Horizon
d. B and C

____ 9. The soil area of Louisiana used mainly for producing cotton, corn and sweet potatoes is the:

a. Flatwoods
b. Mississippi terraces
c. Coastal plain
d. Coastal prairies

____ 10. The soil area of Louisiana used mainly for hunting, fishing and trapping is the:

a. Coastal plain
b. Loessial hills
c. Coastal marsh
d. Flatwoods

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT I: Soil Formation

LESSON 2: Composition of Soil

Part I: Select the term from the column on the right that would make each statement most correct and then write the correct letter in the space provided to the left of the statements.

_____ 1. Decomposing plant or animal material.

_____ 2. Is derived mainly from the breakdown of rocks and minerals from which the soil is formed.

_____ 3. The space between soil particles.

_____ 4. Helps make soil loose and friable.

_____ 5. A major source of phosphorus, sulfur and nitrogen.

_____ 6. Is composed of such things as the roots of plants, green manure crops, leaves, worms, bacteria, farmyard manure, crop residues and insects which are in an active state of decay.

_____ 7. Derived from the decomposition of parent rock.

_____ 8. Supplies energy for micro-organisms.

_____ 9. Is filled with air and water.

_____ 10. Helps to supply the soil with essential plant nutrients and elements such as potassium, phosphorus, magnesium, calcium, sulfur, etc.

A. Pore Space

B. Inorganic Matter

C. Organic Matter

Part II: In the block to the left place a T for true and a F for false.

_____ 1. The two main soil components are organic matter and water.

_____ 2. The soil pore spaces are filled with silt and sand.

_____ 3. Organic matter is found in the pore space of the soil.

_____ 4. The solid portion of the soil is composed of organic and inorganic materials.

_____ 5. The organic matter is a major source of phosphorus and nitrogen.

_____ 6. The 50% solid portion of soil is composed of organic (40%) and inorganic (10%) materials.

_____ 7. The organic matter is derived from living and dead plants and animals.

_____ 8. Inorganic matter helps make the soil friable and loose.

_____ 9. A good condition for plant growth is present when there is about an equal amount of air and water in the pore space.

____ 10. Absence of air or water does not have any effect on plant life.

Part III: After reading the statement, circle the letter of the most correct answer.

1. Spaces between soil particles are:

   a. Organic matter
   b. Soil pores
   c. Inorganic matter

2. A volume of soil is:

   a. 50% solid materials
   b. 40% solid materials
   c. 80% solid materials

3. Soil pore spaces are filled with:

   a. Organic matter
   b. Sand and silt
   c. Air and water

4. During very heavy rain the percent volume of water spaces will:

   a. Greatly increase
   b. Greatly decrease
   c. Remain the same

5. The major source of phosphorus, sulfur and nitrogen is:

   a. Organic
   b. Inorganic
   c. water

6. A good soil condition for plant growth is present when there is:

   a. Equal amounts of air and water in the pore space.
   b. More air than water in the pore space.
   c. More water than air in the pore space.

7. Inorganic matter is derived mainly from the breakdown of:

   a. Worms and bacteria
   b. Rocks and minerals
   c. Plants and animals

8. Organic matter causes soils to become:

   a. More compact
   b. Less compact
   c. The same as before

9. Large amounts of organic material causes soil to:

   a. Become darker
   b. Become lighter
   c. Remain the same

10. Inorganic material would supply plants with which one of the following materials:

   a. Oxygen
   b. Phosphorus
   c. Nitrogen

INSTRUCTIONAL UNIT I: Soil Formation

LESSON 3: Factors Affecting Soil Formation

TRUE - FALSE Circle the correct letter for the following statements.

T F 1. Soil is what it is because of its heredity and environment.

T F 2. Minerals are chemical compounds with definite structure.

T F 3. Rock is developed from soil material in a manner related to their natural surrounding.

T F 4. Weathering of rocks provides soil parent material.

T F 5. Physical weathering occurs as a result of chemical agents.

T F 6. Alluvium is material laid down by wind.

T F 7. Humus is formed from plant and animal residue.

T F 8. Soils developed from sand stone are fine textured.

T F 9. Climate influences the break down of rock and mineral which results in soil development.

T F 10. Weathering is a result of rain fall, freezing, thawing, sunshine and wind.

136 **MATCHING** Match the words in column B to the correct phrase in column A by placing the correct answer in the blank provided.

_____ 1. Solid and massive materials.

_____ 2. A material laid down by running water in the flood plain or bottom lands of streams.

_____ 3. Silty, floury material laid down by wind.

_____ 4. Slope of the ground surface.

_____ 5. Can be looked upon as the single most important factor which affects soil formation.

_____ 6. Is needed to make a soil.

_____ 7. Are formed in the soil from the decayed products of rock and plants.

_____ 8. The process by which rocks and minerals are changed to soil.

_____ 9. Is added to the soil largely by leaves, twigs and logs.

____ 10. Is the loose and partly decayed rock from which soil is formed.

A. Topography
B. Parent Material
C. Mineral
D. Rocks
E. Weathering
F. Alluminum
G. Loess
H. Time
I. Organic Matter
J. Clinate
K. New Chemical
L. Rain Water

MULTIPLE CHOICE Select the best answer by circling the correct letter.

1. Humus has been built from:

   a. A mixture of sand, silt and clay
   b. Plant and animal residues
   c. Sandy loams of low fertility

2. Loess is:

   a. Organic material formed from decaying plants
   b. Soil deposited in flood plains by running water
   c. Silty, floury material laid down by wind

3. The most important factor affecting soil formation is:

   a. Organic matter
   b. Time
   c. Climate

4. Soil parent material is:

   a. Loose and partly decayed rock from which soil is made
   b. Partially decayed plants and animals
   c. Formed from chemical changes in soil minerals

5. Water run-off is directly affected by:

   a. Topography
   b. Parent material
   c. Amount of topsoil

6. Soil on steep slopes usually has a:

   a. Thin surface
   b. Deep to moderate surface
   c. Surface high in organic matter

7. Over a period of time, soil tends to become:

   a. More acid
   b. More shallow in the subsoil level
   c. Less fertile

8. The process by which rocks and minerals are changed to soil during a period of time is called:

   a. Weathering
   b. Soil formation
   c. Topography

138 9. Finely pulverized rock materials or sediments deposited under the sea are called:

a. Loess
b. Alluvium
c. Marine deposits

10. Peat and muck soils are formed from:

a. Rocks and minerals
b. Organic materials
c. Coarse-textured sand

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT II: Soil Properties

LESSON 1: Physical Properties of Soil

PART I: TRUE - FALSE If the statement is correct, place a T in the blank to the left of the numbered question. If the statement is incorrect, place an F.

_____ 1. Soil texture refers to the size of individual soil particles.

_____ 2. Gravel, sand, silt and clay are the types of soil particles.

_____ 3. Soil sturcture is the arrangement of soil particles.

_____ 4. Soil organic matter refers to decomposed plant and animal material found in "B" horizon.

_____ 5. The subsoil is usually lighter in color and is found below the "B" horizon.

_____ 6. The "A" horizon is called the surface soil.

_____ 7. Rock material or gravel is usually found in the "C" horizon which is called parent material.

_____ 8. The subsoil has a minimum effect on water and air movement within the soil and little influence on growing plants.

_____ 9. When the subsoil has uniform bright color and few or no gray mottling, aeration and water movement are good.

____ 10. Gray or mottled subsoils have little or no aeration.

PART II: MULTIPLE CHOICE Select the best answer that completes the statement and place the corresponding alphabet in the space provided on the left of each number.

_____ 1. The texture of a soil is a permanent soil (A) Trait (B) Particle (C) Characteristic (D) Process.

_____ 2. ______ refers to the arrangement of soil particles (A) Texture (B) Structure (C) Profile (D) Horizon.

_____ 3. Granular structures are usually found in (A) Surface layer (B) Subsoil (C) Parent material (D) "B" horizon.

_____ 4. Platy structures are arranged like plates and is usually found in or just below (A) The surface soil (B) The subsoil (C) Parent material (D) None of the above.

_____ 5. Soils that have fine texture and impervious subsoil result in poor water movement and (A) Erosion (B) Aeration (C) Dark color (D) Good permeability.

_____ 6. The size of silt, sand and clay particles are referred to as (A) Structure (B) Texture (C) Classification (D) Prismatic.

_____ 7. _____ is an indicator of the amount of organic matter present in the soil (A) Microorganisms (B) Permeability (C) Aeration (D) Color.

_____ 8. Rock material is found in (A) "B" Horizon (B) "C" Horizon (C) "A" Horizon (D) Subsoil.

_____ 9. Bright colored subsoil is an indicator of (A) Poor drainage (B) Poor aeration (C) Good structure (D) Good drainage and aeration.

PART III: MATCHING Match the terms in column A with the best definitions in column B by placing the letter in the blank provided.

Column A

_____ 1. Loamy Sand

_____ 2. Clay Loam

_____ 3. Clay

_____ 4. Subsoil

_____ 5. Organic matter

_____ 6. Surface soil

_____ 7. Mottling

_____ 8. Parent Material

_____ 9. Texture

____ 10. Structure

Column B

A. Gray streak of spots in the soil

B. Decomposed plant and animal material

C. Poor drainage and aeration

D. Classified as coarse texture

E. Classified as medium textured

F. Classified as moderately fine

G. Classified as fine

H. The size of soil particles

I. Arrangement of the soil profile

J. Arrangement of soil particles

K. "B" Horizon

L. "C" Horizon

M. "A" Horizon

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT II: Soil Properties

LESSON 2: Chemical and Biological Properties of the Soil

PART I: TRUE - FALSE Read each of the following statements. If the statement is true, circle the "T"; if it is false, circle the "F".

T F 1. Most soil nutrients in solution are not available to the plant.

T F 2. Cation exchange capacity does not affect soil pH.

T F 3. Sandy soils have high cation-exchange capacity.

T F 4. The higher the soil pH, the more acidic the soil becomes.

T F 5. Lime makes the soil more acidic.

T F 6. A pH range of 6-7 in the soil makes the plant nutrients more available to the plant.

T F 7. Large animals in the soil help mix soil materials.

T F 8. Soil microorganisms help in making soil nitrogen more available to the plant.

T F 9. Most soils in Louisiana are acid in their natural state.

T F 10. Organic matter decreases cation-exchange capacity in the soil.

143 PART II MULTIPLE CHOICE Select the best answer to each of the statements below and place the letter in the blank provided.

_____ 1. The conversion of free nitrogen from the air into a form plants can use is called:

a. Cation exchange capacity
b. Nitrogen tie-up
c. Nitrogen fixation
d. Nitrogen conversion

_____ 2. A soil having low cation exchange capacity is:

a. Clay
b. Sand
c. Clay loam
d. Silty clay loam

_____ 3. A soil having a high cation exchange capacity is:

a. Sandy loam
b. Clay
c. Sand
d. Silt

_____ 4. A soil pH is increased by more:

a. Hydroxyl ions
b. Calcium ions
c. Hydrogen ions
d. Magnesium ions

_____ 5. We can make an acid soil neutral by adding:

a. Nitrogen
b. Lime
c. Fertilizer
d. Phosphorus

_____ 6. One form of animal life in the soil that punctures plant roots is the:

a. Slug
b. Earthworm
c. Nematode
d. Rodent

_____ 7. Microscopic soil inhabitants that feed on plant material are:

a. Millipedes
b. Earthworms
c. Anthropods
d. Bacteria

_____ 8. Plants without chlorophyll that bear spores are:

a. Bacteria
b. Fungi
c. Nematodes
d. Algae

_____ 9. Which of the following is not an anthropod?

a. Ant
b. Mite
c. Slug
d. Centipede

____ 10. Nitrogen, phosphorus and sulfur are stored in the soil in:

a. Earthworms
b. Organic matter
c. Lime
d. Cations

145 PART III MATCHING Match the statements from Column B with the terms they best fit in Column A. Place your answer in the blank provided.

Column A

_____ 1. Nematodes

_____ 2. Fungus

_____ 3. Kaolinitic

_____ 4. pH

_____ 5. Bacteria

_____ 6. Cation

_____ 7. Sandy soil

_____ 8. Anthropods

_____ 9. Lime

____ 10. Clay Soil

Column B

a. Added to soil to make acid soil neutral.

b. Ion carrying positive change.

c. Soil with low cation-exchange capacity.

d. Microscopic plant.

e. Type of clay.

f. Small soil worms that destroy plant roots.

g. Designation for soil acidity or alkalinity.

h. Soil animals that feed on decaying organic matter.

i. Soil with high cation-exchange capacity.

j. Type of slug or snail.

k. Large animals in the soil.

l. Thrives in neutral soil.

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT III: Soil Acidity and Liming

LESSON 1: Soil Acidity and Alkalinity

TRUE - FALSE In the blank to the left, place T for true or F for false after reading the statement to the right.

1. _____ pH means the presence of hydrogen in the soil.
2. _____ pH scale is a numberical value between 0 and 14 indicating the degree of acidity or alkalinity.
3. _____ A soil with a pH value of 4.6 is alkaline.
4. _____ A soil with a pH value of 8.0 is alkaline.
5. _____ An acid soil is a soil that contains an excess of hydrogen ions over hydroxyl ions.
6. _____ A soil with a pH value of 5.0 is 10 times more acid than a soil with a pH of 6.0.
7. _____ A soil with a pH value of 4.0 is 100 times more acid than a soil with a pH of 6.0.
8. _____ Heavy rainfall increases the alkalinity of the soil.
9. _____ Soils in areas with light rainfall are usually acid.
10. _____ Acid soils can be made more alkaline by adding nitrogen.

147 **MATCHING** Select the term from the column on the right that would make each statement most correct and then write the correct letter in the space provided to the left of the statement.

1. _____ stands for pressure of concentration.
2. _____ refers to a soil with a pH value of 0 - 6.5.
3. _____ refers to the hydrogen ion concentration in a soil.
4. _____ refers to a soil with a pH value of 7.
5. _____ the process of removal of soluble salts from the soil.
6. _____ a chemical substance that develops a characteristic color depending on the acidity or alkalinity of a soil.
7. _____ refers to a soil with a pH value of 7.5 - 14.
8. _____ a numerical value between 0 and 14 used to indicate the degree of acidity or alkaline range.
9. _____ refers to the relative proportion of basic elements such as calcium and magnesium present in relation to the acidic elements hydrogen and aluminum.
10. _____ soil is one which contains an excess of hydrogen ions over hydroxyl ions.

A. Leaching
B. Soil acidity
C. pH indicator
D. pH
E. "p"
F. "H"
G. Acid
H. Alkaline
I. Neutral
J. Alkaline soil
K. Extremely acid soils
L. Clay soil

MULTIPLE CHOICE After reading the statement, circle the letter of the best answer.

1. A soil with an excess of calcium in usually:

   A. Acid
   B. Alkaline
   C. Neutral

2. A soil with an excess of hydrogen and aluminum is usually:

   A. Acid
   B. Alkaline
   C. Neutral

3. Freshly distilled water is:

   A. Acid
   B. Alkaline
   C. Neutral

4. The process of removing soluble salts from the soil is known as:

   A. Leaching
   B. Indication
   C. Acidity

5. Soils with a pH of 6.1 to 6.5 are recommended for:

   A. Tomatoes
   B. Strawberries
   C. Alfalfa

6. Soils with a pH of 5.6 to 6.0 are recommended for:

   A. Crimson clover
   B. Soybeans
   C. Lettuce

7. The usual pH range of soils in humid areas is:

   A. 5.0 to 6.0
   B. 7.5 to 8.5
   C. 6.5 to 7.5

8. During the summer, soils usually:

   A. Increase in acidity
   B. Decrease in acidity
   C. Remain the same

149 9. Generally, crops favor:

A. An acid soil
B. A neutral soil
C. An alkaline soil

10. Carbon dioxide and water combine in the soil to form:

A. A base
B. An acid
C. A salt

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT III: Soil Acidity and Liming

LESSON 2: Liming to Correct Soil Acidity

In the blank to the left place T for true or F for false after reading the statement.

_____ 1. Lime is a material whose calcium and magnesium content is capable of neutralizing soil acidity.

_____ 2. Leaching is the process of removal of soluble salts from the soil by the passage of water through the soil.

_____ 3. Limestone is a sedimentary rock which contains potassium.

_____ 4. Liming encourages more plant growth and plant residue.

_____ 5. Almost all lime used on acid soils consist of finely ground limestone.

_____ 6. Too much lime on any soil may cause plants to be chlorotic (yellow or white).

_____ 7. Generally crops favor a slightly acid soil.

_____ 8. Crops that thrive best on strongly acid soils include the blueberry, watermelon and azaleas.

_____ 9. Areas low in magnesium need dolomitic lime.

____ 10. For most crops a pH of 5 to 6 is most desirable.

151 Match the best answer from the right with the statements to the left by placing the correct letter in the blank.

_____ 1. A sedimentary rock which contains calcium carbonate.

_____ 2. The physical condition of a soil.

_____ 3. The removal of soluble salts from soil by water.

_____ 4. Grows best in a slightly acid soil.

_____ 5. Refers to the acidity or alkalinity of a soil.

_____ 6. The conversion of free nitrogen.

_____ 7. Refers to a high pH.

_____ 8. A pH of 7.0.

_____ 9. A condition in plants resulting from the failure of the development of chlorophyll.

____ 10. Refers to a low pH.

A. Soil tilth

B. Limestone

C. Nitrogen fixation

D. Neutral

E. pH

F. Alkaline

G. Leaching

H. Chlorosis

I. Strawberries

J. Acid

K. Strongly acid

L. Field peas

M. Green leaf disease

After reading the statement, circle the letter of the most correct answer.

1. A soil with a pH of 6.1 to 6.5 is recommended for:

   a. Sweet corn
   b. Tomatoes
   c. Strawberries

2. A pH of 7.0 is:

   a. Acid
   b. Alkaline
   c. Neutral

3. Too much lime on soil may cause the following:

   a. Phosphorus may become less available.
   b. Will cause the soil to become compacted.
   c. May cause animals to lose their hair.

4. Lime may be applied with a:

   a. Manure spreader
   b. Wheel barrow
   c. Foot-tub
   d. All of the above

5. Leaching is a condition which causes:

   a. Acidity
   b. The increase of available nitrogen.
   c. The increase of available phosphorus.

6. Lime on acid clays:

   a. Increases desirable soil structure.
   b. Decreases desirable soil structure.
   c. Has no effect.

7. Lime encourages:

   a. More plant growth.
   b. More plant residue.
   c. Both the above.

8. Liming helps to:

   a. Raise soil pH.
   b. Lower soil pH.
   c. Has no effect.

153 9. Almost all lime used on acid soils consist of:

   a. Finely ground salt.
   b. Finely ground limestone.
   c. Finely ground sediment.

10. The finer the lime is ground:

   a. The faster it reacts.
   b. The slower it reacts.
   c. Has no effect on reaction.

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT IV: Soil Classification and Land Use

LESSON 1: Soil Classification and Land Use Evaluation

TRUE - FALSE Circle the correct letter for the following statements.

T F 1. Land classification systems are grouped according to their capability.

T F 2. Slope is not a factor in land classification.

T F 3. Sand is the floury material which is felt when the soil is rubbed between the fingers.

T F 4. Loam is a combination of sand, silt and clay.

T F 5. Deep soils are more than 36 inches deep.

T F 6. Erosion is the loss of soil by water and wind.

T F 7. There are six major land capability classes.

T F 8. Soils with pH's of 4 and 5 are usually soils requiring lime.

T F 9. Soil structure and soil texture are the same.

T F 10. The adequate level of nitrogen in the soil is dependent mostly on the yield goals rather than a deficient level.

155 MULTIPLE CHOICE Select the best answer that completes the statement and place the corresponding alphabet in the space provided on the left of each number.

____ 1. A systematic grouping of soils which is based upon properties that can be recognized by sight or feel.

a. Soil series
b. Soil classification
c. Soil family
d. Soil maps

____ 2. The gritty material which is felt when the soil is rubbed is:

a. Silt
b. Sand
c. Loam
d. Clay

____ 3. Which of the following are soil class factors:

a. Slope
b. Depth of soil
c. Permeability
d. All of the above

____ 4. Which of the following pH's are acetic?

a. 7.0
b. 6.2
c. 7.2
d. All of the above

____ 5. Which of the following is not a physical characteristic of the soil?

a. Erosion
b. Slope
c. Drainage
d. pH

____ 6. Which depth indicates a shallow soil?

a. 10 to 20 inches deep
b. 36 inches deep
c. less than 10 inches deep
d. All of the above

____ 7. Scale drawings, sketches or photographs showing different soil series are:

a. Soil phases
b. Soil maps
c. Soil classification
d. Soil family

____ 8. Which soil class has severe limitations that limits its use to pasture, woodland or wildlife?

a. Class I
b. Class V
c. Class VII
d. Class II

____ 9. Soil may be placed into relative permeability classes through studies of:

a. Structure
b. Texture
c. Cracking
d. All of the above

____ 10. A slope that falls 1 to 3 feet in each 100 feet is:

a. Nearly level
b. Gently sloping
c. Strongly sloping
d. Very steep

157 MATCHING In the blanks to the left, match the correct terms to the following statements.

_____ 1. Refers to soil area denoting location or use.

_____ 2. Includes soil series whose properties would have similar effects on plant growth.

_____ 3. A subdivision of the soil series based on texture of the top soil.

_____ 4. A systematic grouping of soils which is based upon properties that can be recognized by sight or feel.

_____ 5. A group of soils similar in most respects but varying in texture of the top soil.

_____ 6. Represents variations within the soil type based on textures such as slope, drainage, or degree of erosion.

_____ 7. Term used to describe the tendency of soil particles to stick together in clumps or structural units.

_____ 8. Include soil series with two or more similar profile characteristics and located in the same general area.

_____ 9. Scale drawings, sketches or photographs of areas showing different soil series, types or land use classes.

_____ 10. Denotes cropping practices for which land is best suited or capable of supporting.

A. Soil Classification

B. Soil Series

C. Soil Type

D. Soil Phases

E. Soil Structure

F. Consistence

G. Soil Association

H. Soil Family

I. Soil Texture

J. Soil Maps

K. Land

L. Land Capability

M. Permeability

N. Erosion

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT V: Soil Fertility & Fertilization

LESSON 1: Nutrient Requirements of Plants

PART I: If the statement is true, place a "T" in the blank to the left of the numbered question. If the statement is false, place an "F".

_____ 1. Secondary nutrients are those needed by plants in large amounts.

_____ 2. Primary nutrients are elements needed by plants in small amounts.

_____ 3. Trace elements are nutrients needed by plants in very small amounts.

_____ 4. Any element taken in by the plant and used in the manufacture of food or tissue is called a nutrient.

_____ 5. Humus is the decomposed part of organic matter.

_____ 6. Phosphorus increases the protein content of a crop.

_____ 7. A dark green color in plants is an indication of an adequate nitrogen supply.

_____ 8. Phosphorus stimulates root formation and growth in plants.

_____ 9. Slow growth and dwarfed plants are symptoms of phosphorus deficiency.

____ 10. An adequate potassium level increases a plant's resistance to diseases.

PART II MULTIPLE CHOICE

In the blank to the left, place the letter which indicates what type of nutrient that element is.

_____ 1. Calcium

_____ 2. Iron

_____ 3. Magnesium

_____ 4. Nitrogen

_____ 5. Molybdenum

_____ 6. Potassium

_____ 7. Boron

_____ 8. Copper

_____ 9. Phosphorus

_____ 10. Sulfur

A. Primary nutrient

B. Secondary nutrient

C. Trace element

PART III MULTIPLE CHOICE Circle the letter that best completes the statement or answers the question.

_____ 1. Plants obtain hydrogen, oxygen and carbon from:

a. Commercial fertilizers
b. CO_2 and H_2O
c. Nitrogen fixation
d. all of the above

_____ 2. Decreases winter hardiness

a. Calcium
b. Phosphorus
c. Nitrogen
d. Potassium

_____ 3. Aids in nodule formation on legumes

a. Phosphorus
b. Potassium
c. Iron
d. Boron

_____ 4. Produces stiff stems and reduces lodging in corn.

a. Nitrogen
b. Phosphorus
c. Potassium
d. Manganese

_____ 5. Neutralizes acids produced in plants.

a. Calcium
b. Copper
c. Iron
d. Lead

_____ 6. Increases the calcium content of food and feed crops

a. Nitrogen
b. Zinc
c. Phosphorus
d. None of the above

_____ 7. Which of the following elements do not assist in the formation of chlorophyll?

a. Iron
b. Copper
c. Manganese
d. Zinc

161 _____ 8. Which of the following is an example of a 1-2-1 ratio?

a. 8-24-24
b. 13-13-13
c. 5-10-5
d. 8-8-8

_____ 9. One hundred pounds of 8-24-84 analysis fertilizer contains how many pounds of nitrogen?

a. 24 c. 56
b. 8 d. 32

____ 10. Which of the following is a trace element?

a. Nitrogen
b. Phosphorus
c. Manganese
d. Potassium

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT V: Soil Fertility and Fertilization

LESSON 2: Organic and Inorganic Fertilizers

PART ONE: TRUE - FALSE If the statements below are true place a "T" in the blank to the left of the question. If the statement is false place an "F".

_____ 1. Calcium phosphate, murate of potash, calcium carbonate and limestone are all sources of inorganic fertilizers.

_____ 2. Urea, humus, organic matters and decayed plant material are all sources of organic fertilizers.

_____ 3. The main plant nutrients supplied by organic and inorganic fertilizers are nitrogen, phosphorus and potassium.

_____ 4. A complete analysis of fertilizer materials includes the percentage of nitrogen, phosphorus and potassium.

_____ 5. The process by which nitrates are formed from ammonia is known as nitrification.

_____ 6. Any fertilizer that is capable of increasing the residual acidity of the soil is known as acid forming fertilizer.

_____ 7. P_2O_5 is the chemical formula for phosphoric acid.

_____ 8. An incomplete fertilizer is a fertilizer lacking either nitrogen, phosphorus or potash in the mixture.

_____ 9. Multinutrient fertilizer refers to any fertilizer containing two or more plant nutrients.

_____ 10. Muriate of potassium contains 60-62 percent soluble potassium.

163 PART TWO: MULTIPLE CHOICE Place the letter in the space to the left of each question which best completes the statement.

_____ 1. A complete fertilizer contains

a. Nitrogen
b. Phosphorus
c. Potassium
d. All of the above

_____ 2. The process of changing nitrogen from the air into nitrogen compounds by soil bacteria is called

a. Denitrofication
b. Nitrification
c. Bacterial Nitrogen
d. Nitrogenfication

_____ 3. The nitrogen in most chemical fertilizers is readily soluble and available for use by plants, however, plants need nitrogen

a. Daily
b. At time of germination
c. At low temperatures
d. During dry weather

_____ 4. Slow release nitrogen fertilizers are especially useful on

a. Clay soil
b. Loamy soil
c. Heavy soil
d. Sandy soil

_____ 5. The plant food element that assist the plant in cell dimension and the formation of fats and protein.

a. Nitrogen
b. Phosphate
c. Urea
d. Potash

_____ 6. The fertilizer nutrient that is concentrated in the seeds and fruits of plants and hasten their development is

a. Calcium Carbonate
b. Murate of Potash
c. Ammonium Nitrate
d. Phosphoric Acid

_____ 7. Soil scientist estimates the increase in soil nitrogen by bacteria which lives in the soil, independent of higher plants, to be from 164

a. 5-10 pounds per acre per year
b. 10-20 pounds per acre per year
c. 10-50 pounds per acre per year
d. 60-70 pounds per acre per year

_____ 8. The most common classes of multinutrient fertilizers are

a. Grandulated formulations and bulk blends
b. Liquid formulation fertilizers
c. Suspensions and slurries
d. All of the above

_____ 9. Other possible sources of organic fertilizer other than animal manure are

a. Sewage
b. Garbage
c. Sludge
d. All of the above

____ 10. Many soils are lacking in available potassium even though the average plow layers contain

a. 5,000 pound per acre
b. 10,000 pound per acre
c. 20,000 pound per acre
d. 40,000 pound per acre

165 PART THREE: MATCHING Place the alphabet from column B beside the best answer in column A.

COLUMN A

_____ 1. Acid forming fertilizer

_____ 2. Analysis

_____ 3. Brand Name

_____ 4. Bulk fertilizer

_____ 5. Grade

_____ 6. Non Acid forming

_____ 7. Organic

_____ 8. Ratio

_____ 9. Fertilizer

____ 10. Complete fertilizer

COLUMN B

A. Fertilizer grade divided by highest common divisor.

B. Capable of increasing residual acidity.

C. Not capable of increasing residual acidity.

D. Supply the soil with nutrients.

E. Contain nitrogen, phosphorus and potassium.

F. Organic and inorganic matter.

G. Fertilizers not soluble in water.

H. Specific patent applied to a specific fertilizer.

I. Sources of fertilizers.

J. The minimum guarantee of plant nutrients expressed as percentage numbers.

K. Designate actual percentage composition.

L. Delivered in solid or liquid state.

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT V: Soil Fertility and Fertilization

LESSON 3: Application of Fertilizers

PART I: If the statement is true, place a "T" in the blank to the left of the question. If the statement is false, place an "F".

_____ 1. When fertility level of the soil is low, fertilizers must furnish a major portion of the nutrients needed by the crops.

_____ 2. The amount of fertilizer to apply may depend on the value of the crop.

_____ 3. The nature of soil does not affect the amount of fertilizer to apply to a crop.

_____ 4. The closer the time of application to the time nutrients will be used by the crop the better.

_____ 5. For annual crops, the fertilizer application is frequently done in the fall.

_____ 6. Labor and time saved are advantages of the broadcast method.

_____ 7. The possibility of weed competition is increased when broadcast method is used.

_____ 8. Top dressing application should be made during the late spring.

_____ 9. The main advantage of side dressing is to supply readily available fertilizers for the plant.

_____ 10. Foliar application of the primary plant nutrients are seldom practical because of the large amount needed and greater cost.

167 PART II: MULTIPLE CHOICE Select the answer that best completes the statement and place the corresponding alphabet in space provided.

_____ 1. The amount of fertilizer does not depend on

a. Soil test
b. Crop to be grown
c. Nature of the soil
d. Plant tissue

_____ 2. Fertilizers are applied to

a. Increase soil fertilizer
b. Improve the crop
c. Stimulate plant growth
d. Improve seed quality

_____ 3. Top dressing application should be made during

a. Summer months
b. Late winter
c. Spring
d. Late winter or early spring

_____ 4. This is a good method of applying nitrogen in sandy soil.

a. Broadcast
b. Top dressing
c. Side dressing
d. Row placement

_____ 5. The main advantage of this method is it supplies readily available fertilizers to the plant, enabling it to grow faster.

a. Row placement
b. Side dress
c. Top dress
d. Broadcast

_____ 6. Anhydrous ammonia should be

a. Broadcast
b. Injected
c. Side dress
d. Top dress

_____ 7. The labor and time saved are advantages of ______.

a. Broadcast
b. Injection
c. Row placement
d. Side dress

_____ 8. For annual crops, fertilizer application is frequently at or near __________.

a. Harvesting
b. Germination
c. Seeding time
d. Past seeding time

_____ 9. The hazard of fertilizer injury occurs when large amount of fertilizer is placed

a. Before seeding
b. Too close to the plant
c. In the row
d. Directly after seeding

____ 10. Anhydrous ammonia application is easy to combine with other tillage operations such as

a. Plowing
b. Discing
c. Planting
d. All the above

169 PART III MATCHING Place the alphabet from column B that best answers the phrase or term from column A.

Column A

_____ 1. Deep drilling

_____ 2. Top dressing

_____ 3. Side dressing

_____ 4. Broad casting

_____ 5. Now placement

_____ 6. Foliar application

_____ 7. Soil injection

_____ 8. Soil test

_____ 9. Disadvantage of row placement

____ 10. Advantage of side dressing

Column B

a. Placing fertilizer to one side and below the level of the seed.

b. Anhydrous ammonia is applied using this method.

c. One way to apply additional nitrogen to the plants.

d. Placing of fertilizer in bands at selective depth.

e. Indicate relative fertility level of the soil.

f. Application of fertilizer on top of the soil after plant growth has started.

g. Placing the fertilizer near after it has started to grow.

h. It supplies readily available fertilizer to the plant.

i. Seldom practical because of large amounts needed and greater cost.

j. It is generally sprayed or dribbled on soil surface.

k. Spreading the fertilizer by use of spreader.

l. Time and labor involved are high.

INSTRUCTIONAL AREA: Soil Science

INSTRUCTIONAL UNIT VI: Soil Water

LESSON: Classification -- Gravitational, Capillary, Hygroscopic and Water-holding Capacity of Soil

PART I: TRUE - FALSE Read the statements and circle the correct letter, "T" for true and "F" for false.

T F 1. Transpiration is the process of water drawn from a lake.

T F 2. Gravitational water is that portion of soil water that moves downward because of the pull of gravity.

T F 3. Evaporation is the process where liquid water is taken into the plants by their leaves and roots.

T F 4. Soil of granular structure will allow water to move into them readily.

T F 5. The larger the soil particles the greater it's water holding capacity.

T F 6. Growing plants remove water from a soil.

T F 7. Warm air will hold more water than cool air.

T F 8. Organic matter aids in separating particles of clay, silt and sand.

T F 9. Hygroscopic water is unavailable to plants.

T F 10. A terrace is a broad bank of soil with gentle sloping sides.

171 PART II MULTIPLE CHOICE Read the complete statement below and select the best answer by circling the correct letter. 171

1. Strip cropping refers to a system of alternate strips of sod and row crops running (a) vertical (b) horizontal (c) parallel.

2. Transpiration is the term used to describe the loss of water vapor from (a) lakes (b) plants (c) soil (d) all of the above.

3. Surface mulches aid in conserving (a) soil (b) water (c) all of the above.

4. Fine textured soils have (a) more total surface area (b) less total surface area (c) same as coarse textured soil.

5. Forms in which water can be found in the soil are: (a) gravitational (b) capillary (c) hygroscopic (d) all of the above.

6. Evaporation is the process where water changes into (a) gas or vapor (b) solid or liquid (c) ice.

7. Compacting soil with heavy machinery (a) destroys structure (b) increases water holding capacity (c) improves structure.

8. Clay soils have particles of (a) large (b) small (c) medium sizes.

9. Conservation of soil water may be done by (a) terraces (b) strip cropping (c) all of the above.

10. Mulching (a) reduces soil temperature (b) conserves soil (c) conserves water (d) are of natural and artificial types (e) all of the above.

PART III MATCHING Match the answers from column B with the terms they best fit in column A. Place answer in the blank provided.

Column A

_____ 1. Gravitational water

_____ 2. Capillary water

_____ 3. Hygroscopic water

_____ 4. Water-holding capacity

_____ 5. Available soil water

_____ 6. Wilting point

_____ 7. Infiltration rate

_____ 8. Evaporation

_____ 9. Transpiration

_____ 10. Methods of conservation of soil

Column B

a. Amount of water a soil can retain.

b. Plants wilt and will not recover after water is added.

c. Water that moves downward because of the pull

d. Water in soil that heavy machinery pushes out.

e. Water that is absorbed by organic matter.

f. Soil water held in pores as a result of attractive forces between the water, soil particles and unavailable to plants.

g. Amount of water present in a soil which can be removed by plants.

h. Strip cropping, terraces, mulching and adequate fertilization.

i. Time required for a given amount of water to pass through a soil.

j. Water that runs off a field from a downpour rain.

k. Thin films of water around soil particles and is unavailable to plants.

l. Process by which water, as a vapor, is lost by living plants.

173

m. Process whereby liquid water changes into a gas or vapor.